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# 3.0

## Manage hazardous substances risks

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### 3.1 Hazardous substances can damage your health

Some risks related with hazardous substances are obvious. For example, highly flammable substances like petrol, acetone or methylated spirits must be kept away from an open flame to prevent a fire or an explosion.

Serious accidents like explosions do happen, but don't forget the less obvious harm hazardous substances can cause, especially due to the following types of exposure:

- **Breathing in toxic vapours, dusts, mists, gases or fumes from hazardous substances.**

If you can smell it, you are breathing it in. But don't depend on smell alone, as your sense of smell can become overloaded and even though you may no longer be able to smell the substance, it might still be in the air.

Some toxic hazardous substances don't have a smell, so you shouldn't use smell as the only indicator that hazardous substances are present.

- **Hazardous substances being absorbed through your skin and entering your blood stream.**

If you touch something exposed to hazardous substances (eg tools, PPE, surfaces) without wearing proper protection, you could absorb the substances through your skin.

- **Swallowing or ingesting hazardous substances.**

Hazardous substances can be accidentally swallowed, for example, if you eat or smoke without washing your hands after using hazardous substances.

Solvent vapours are an example of how hazardous substances can harm you when you breathe them in, with immediate effects like headaches, forgetfulness, drowsiness, dizziness and/or nausea, irritability and mood changes, and irritation of the eyes, lungs and skin.

Long-term effects may not be immediately obvious but can be more serious, such as personality changes, sleep disorders, memory loss, cancer, damage to the liver and kidneys, harm to unborn children, fertility problems, and even death.

To avoid these consequences, you must manage risk to keep yourself, your workers and your workplace safe.

### 3.2 Applying substance controls

To protect you from risk, you must put in place specific technical controls whenever hazardous substances are present in your workplace above specified thresholds. The following steps show you how to use the Calculator to find the key controls for your substances.

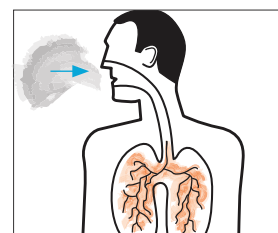
#### 1. Make a list of all of your substances

First, make a list of all of the substances used, stored, handled or manufactured (ie mixed or blended) at your workplace including any waste created from manufacturing or industrial processes. Include all substances to begin with; even the ones you might not think are hazardous.

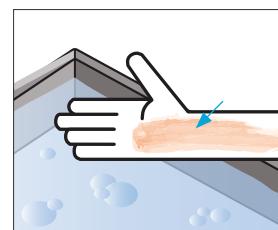
#### 2. Obtain a safety data sheet for each substance

A safety data sheet (SDS) provides information on the hazards posed by a hazardous substance and safe ways to use, store, transport and dispose of it. You need to obtain an SDS for each hazardous substance from its manufacturer,

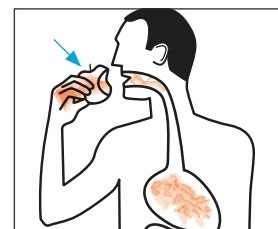
Inhalation



Skin absorption



Ingestion



**FIGURE 2:**  
How hazardous substances enter the body

importer or supplier when it is first supplied to you, when it is supplied to you for the first time in five years, or when it is supplied for the first time after any changes are made to its SDS. See pages 28-29 for more information, including when you don't need an SDS.

### 3. Determine whether your substances are hazardous

Next, determine whether your substances are hazardous. Read the label for warnings (eg causes skin irritation) and the SDS, especially the Hazards Identification section, to find out whether the substance is hazardous.

Only hazardous substances can be entered into the Calculator and only hazardous substances have a hazard classification.

Some substances may be hazardous to health without being classified as hazardous substances (eg wood dust). Although you need to manage the risks associated with these substances, they do not need to be entered into your inventory.

See the definition of hazardous substances in the Glossary.

### 3.3 Prepare an inventory of your hazardous substances

You must prepare an inventory of the hazardous substances that you use, handle, manufacture or store in your workplace, and ensure that the information in it is up-to-date.

The inventory must include:

- the product or chemical name and UN number of each hazardous substance
- the maximum amount of each hazardous substance likely to be at the workplace
- the location of the hazardous substances
- specific storage and segregation requirements and
- the current SDS for each hazardous substance or a condensed version of the key information from the SDS.

The inventory also needs to include waste likely to meet the criteria to be classified as a hazardous substance.

The inventory should also include other information useful for identifying the substance (eg classification, UN class and packing group, approval number) and about its storage (eg container size and type, whether the container is open or closed, or whether the substance is a solid, liquid or gas).

### 3.4 Find and implement the key controls with the Calculator

Enter the hazardous substances in your inventory into the Calculator. Generally the name of the hazardous substance is enough, but you can also enter the HSNO approval number or CAS number.

If you cannot find your substance in the Calculator with this information, you can search for it using the name or HSNO approval number of the group standard it is approved under, followed by its hazard classifications.

If you do not have these, use the UN class and UN packing group found in Section 14 of the SDS. You may also need to enter information about the type of storage.

Then, after you enter information about maximum quantities, the Calculator will then list the key controls that apply to your substances.

Implement the controls for your substances provided by the Calculator and any additional controls from the HSNO approval. Check the SDS for any other controls that may apply to a specific substance.

### 3.5 Manage remaining hazardous substance risks

You need to manage risk remaining after you put in place the controls for the substances in your inventory. Assess your workplace to identify risks and think about possible exposure to the substances.

If it is reasonably practicable to do so, eliminate or substitute hazards, if not, minimise the risk. Choose control measures that protect multiple workers at once.

Engage workers in identifying hazards, assessing health and safety risks and proposing changes that affect their health and safety, including decisions about:

- how to eliminate health and safety risks and resolve health and safety issues
- how to minimise health and safety risks
- procedures for monitoring worker health and workplace conditions
- procedures to provide information to, train and instruct workers.

Worker engagement can take place through health and safety representatives (HSRs), health and safety committees (HSCs) and unions.

#### Identify the risks

When identifying the risks in your workplace, think about:

- the amount of the hazardous substance you have in the workplace
- any related physical or chemical hazards possible reactions with other substances
- ignition sources
- structures or plant or systems of work involved in using, handling, manufacturing or storing substances
- work carried out by workers with the substance and their risk of exposure to it and the likely degree of that exposure, and
- any prescribed exposure standards or restricted entry intervals for the substance.

Think about the people who work directly with hazardous substances in your workplace and the people who could come into contact with hazardous substances in the area where they are used. Observe your workers as they work, and discuss their work practices with them.

Don't forget people (eg cleaners) who may have contact with substances on contaminated surfaces and other people like contractors, visitors and workers who do not directly use hazardous substances but who may still be exposed to them.

Consider whether the people you have identified above could be exposed to a substance by breathing it in, ingesting it or absorbing it through their skin.

#### If exposure is likely, determine how serious it is

To determine the degree of exposure you need to know the concentration of the substance during exposure and how long and how often people are exposed to it by looking carefully at work processes.

You probably won't be able to accurately assess the degree of exposure yourself, as assessment usually involves measuring air concentrations of hazardous substances or measuring hazardous substances in urine or blood. Air measurements usually require workers to wear personal monitoring equipment as they do their job. This monitoring should be done by trained and competent professionals.

To find competent people to monitor exposure levels, see the website of the New Zealand Occupational Hygiene Society at: [www.nzohs.org.nz](http://www.nzohs.org.nz)

You can also see the list of member associations of the Health and Safety Association of New Zealand, under 'Who we are' at: [www.hasanz.org.nz](http://www.hasanz.org.nz)

## Eliminate the substance or, if you can't, substitute it for a less hazardous one

If possible, getting rid of the hazard altogether from your workplace is the best solution. To decide which substances do not need to be in your workplace, ask yourself:

- Are there hazardous substances I no longer use?
- Am I storing more hazardous substances than I need?
- Are there hazardous substances that I can't identify or that are unlabelled?

If you answer yes to any of the above, have the hazardous substance you no longer need disposed of safely. Reducing the amount of hazardous substances may reduce your compliance needs and costs.

Check the SDS for disposal information. Check if your local council has any rules about disposing of hazardous substances safely or choose a specialist chemical waste disposal company.

If you use, handle, manufacture or store a very hazardous substance, ask your supplier if you can substitute it with a safer alternative.

For example, solvent based inks can sometimes be replaced by vegetable oil based inks. You still need to consider the risks associated with the safer alternative product.

## Minimise the risk: isolation and engineering controls

**Isolating** the substance or its use may be the most effective way to manage the risk posed by your substance.

One example of isolating the hazard is spray painting in a booth that is fully automated and doesn't require anyone to enter. Another example is using an automated process for removing objects from degreasing baths.

You can minimise people's exposure to hazardous substances by using **engineering controls**, such as ventilation.

The most effective engineering controls contain the hazardous substance or prevent it from reaching workers.

Ventilation reduces worker exposure and the potential for a fire or explosion by diluting flammable vapours in the air around where hazardous substances are used, handled, manufactured or stored.

Local exhaust ventilation captures contaminants at, or very near, the source and vents them outside.

These systems should be installed and frequently maintained by a specialist, like a ventilation engineer or health and safety specialist because if they are not properly maintained or not up to the job, they may provide little or no protection for workers.

## Minimise the risk: administrative controls

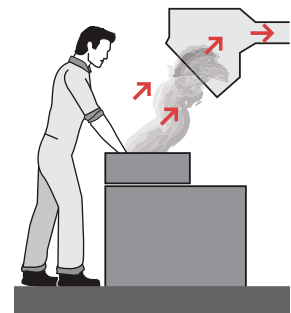
If you cannot eliminate or substitute a substance, and if risk still remains after isolating the hazard and implementing engineering controls, minimise exposure by implementing administrative controls. These are processes to make your workplace safer.

Some examples are:

- job rotation, reducing how long a worker is exposed to a hazardous substance
- restricting access to areas where hazardous substances are used
- not allowing smoking or eating where hazardous substances are used.



**FIGURE 3:**  
Substituting hazardous substances for less hazardous ones



**FIGURE 4:**  
**Local exhaust ventilation**  
This illustration of local exhaust ventilation was taken from Safe Work Australia's Code of practice: *Managing risks*

## Personal protective equipment (PPE)

For some substances, PPE is always required and you must make sure it is provided at all times. PPE is also part of the process to manage any risk remaining after you put in place the specific controls for your substances.

If you cannot eliminate or substitute a substance and risk remains after you put in place isolation, engineering and administrative controls, minimise the remaining risk by providing or ensuring the use of appropriate PPE. Consider:

- the hazardous substance workers are dealing with
- the level of hazardous substances in the air at your workplace
- the hazard information on the label or SDS.

Workers have a right to receive the PPE they need to do their job safely free of cost. They can also use their own, if they freely choose to do so, and their PPE is right for the job.

Whether you provide the worker with PPE or the worker provides their own, you need to ensure that it is suitable for the work and that it fits properly.

You need to provide workers with training and instruction about how to use, maintain, clean and store PPE.

Workers must:

- wear the PPE in line with the information, instruction and training they have received from the PCBU
- not intentionally damage or misuse it
- inform the PCBU if PPE is damaged or defective, or if it needs cleaning or decontamination.

You need to ensure that other persons at the workplace use or wear PPE in line with the information, training or instruction you provide.

When choosing PPE ask a health and safety specialist or your supplier for help and explain to them what job the PPE will be used for. Choose products that meet New Zealand and/or Australian Standards.

### EXAMPLES OF PPE

#### Eyes

To protect your eyes from hazardous substances splashing into them use safety glasses, goggles, face-shields or visors.

#### Breathing

Dusts, vapours, mists, fumes and gases can be inhaled when using hazardous substances. Half or full-face respirators, air-fed helmets or breathing apparatus can protect workers from inhaling hazardous substances.

#### Body

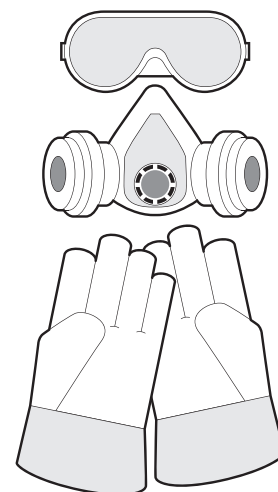
Suitable overalls can help to protect the body from hazardous substances.

#### Hands and arms

Gloves made out of a suitable material should be worn when handling hazardous substances.

#### Feet and legs

Suitable footwear should be worn to protect feet. This could include safety boots or closed-toe shoes.



**FIGURE 5:**  
Examples of PPE

PPE only works if it's used correctly. If the wrong sort is used, or it doesn't fit, it won't do its job. You must ensure it is kept clean and in working order and maintained, or repaired and replaced so it continues to minimise risks to health and safety.

Check your workers are using PPE properly and that it fits properly. Talk to them about the PPE, watch how they use it and what they do with it after they finish their work.

### 3.6 Review control measures

Review your control measures to make sure they are still effective:

- if a control measure is not controlling the risk it was meant to control (eg when an incident occurs)
- before a change at the workplace that is likely to create a new or different risk that the control measures may not control (eg a new substance is used)
- if a new hazard or risk is identified
- if you receive:
  - results from exposure monitoring that show a worker was exposed to a substance hazardous to health at a potentially harmful concentration and has an elevated level of that substance or its metabolites in his/her body
  - results from health monitoring show that a worker may have contracted a disease or illness or suffered an injury due to working with a health hazard that has monitoring requirements
  - a recommendation in an exposure or health monitoring report for you to take remedial measures
- if exposure monitoring shows that the concentration of a substance exceeds a prescribed exposure standard or accepted guidelines, such as the Workplace Exposure Standards and Biological Exposure Indices, available on our website
- if engaging with your workers indicates that control measures need to be reviewed
- if a health and safety representative asks for control measures to be reviewed.

### 3.7 Health and exposure monitoring

You have a duty of care to ensure, so far as reasonably practicable, the health and safety of workers while they work at the workplace. This includes making sure worker health and workplace conditions are monitored, so far as is reasonably practicable.

*Health monitoring* means monitoring a person to identify any changes in his or her health because of exposure to health hazards arising from their work. You must monitor workers' health if:

- their exposure to a substance hazardous to health warrants it
- it is possible that workers are being exposed to hazardous substances, to check that your minimisation techniques, control measures and PPE are protecting their health
- it is required in a safe work instrument.

An example of health monitoring is spirometry testing to detect early changes in lung function.

*Exposure monitoring* means measuring and evaluating a person's exposure to a health hazard. It includes monitoring workplace conditions and biological monitoring of people at the workplace. It can show if workers are potentially being exposed to a hazard at harmful levels and if control measures are working effectively.

Exposure monitoring is only a requirement if it is specified in:

- a prescribed exposure standard
- regulations under HSWA
- a substance or group standard approval under the HSNO Act
- a safe work instrument.

It is also required if you are uncertain whether a worker's exposure to a hazardous substance exceeds a prescribed exposure standard.

Examples of exposure monitoring are workers wearing personal monitoring equipment as they work or biological exposure monitoring – testing a worker's blood or urine for the presence of a harmful substance or its by-products (metabolites).

Even if not required, exposure monitoring can work together with health monitoring to give a better idea of whether your control measures are working correctly.

### 3.8 Information, instruction and training

Make sure everyone at the workplace has the information, training, instruction or supervision they need to protect themselves from the risks of hazardous substances.

Whenever anyone does work, uses plant or deals with a substance that causes a risk in a workplace, make sure they have knowledge and experience of similar places, work, plant or substances so they don't harm their own or other people's health and safety. If they don't have this knowledge or experience, make sure they are supervised by someone who does.

Workers also need to know where to find information about how to safely handle and store hazardous substances in the workplace, and the hazards these substances can cause. This includes safety data sheets, but is not limited to them.

Workers must also be adequately trained. Training needs to cover all plant, objects, substances or equipment the worker may use or handle, including PPE (how to wear, use, clean and store it safely) and control measures in place to reduce risks caused by those hazardous substances. The training and instruction needs to reflect:

- the nature of the work
- what is known about the risks involved with the work at the time the supervision and training is provided
- control measures in place to reduce the risks caused by those hazardous substances (eg ventilation).

Make sure training and instruction covers:

- the hazards of the hazardous substances that the worker will work with (eg are they flammable, corrosive, toxic)
- the control measures in place to reduce the risks caused by those hazardous substances (eg ventilation)
- how to safely use, handle, manufacture, store and dispose of the substances
- any specific duties the worker has under the regulations (eg making sure tanks are not filled beyond their maximum filling level)
- what the worker needs to do in an emergency involving the hazardous substances.



Make sure that your worker gets the practical experience they need in your workplace under direct supervision and that you keep a record of the training and instruction you provide to the worker. Even if a worker has previous training from another workplace you need to provide an induction to your workplace and supervised experience in your workplace.

Engage workers in decision-making about procedures for supervision, training, information and instruction. Make sure training, information and instruction are readily understandable – spend extra time with workers with reading difficulties or whose first language is not English.

### 3.9 Young people

Young people under 15 years old must not be present where you use, manufacture or generate hazardous substances. However, young people can be present:

- in areas where the public usually has access
- when the young person is under direct and active adult supervision suitable for the person's age and the risks
- when the young person is on a guided tour of the area, or
- in any areas used only for selling goods or services.

This means that young people can do school science experiments under adult supervision, or they can be present in the retail area of a factory as long as they stay only in the area where goods or services are sold.

#### CHECKLIST

##### What your workers need to know

- Does the worker know the harm that can be caused from each hazardous substance they use at work?
- Does the worker know how to safely store, use or dispose of each substance they use?
- Does the worker understand what control measures are in place at the workplace to reduce exposure and keep safe?
- Has the worker been provided with the correct safety gear and PPE and does it fit properly?
- Has the worker been trained to use the safety gear and PPE?
- Does the worker know where the safety data sheets are kept and have access to them?
- Has the worker been trained to use safety data sheets?
- Does the worker know what to do in an emergency involving the substances they use?
- Has the worker been trained to use the first aid equipment to deal with splashes and other incidents?
- Has the worker had an appropriate period of practical experience under direct supervision reflecting the risks associated with the hazardous substances?
- Does the worker understand the importance of asking their supervisor questions if they are unsure about how to safely use, handle or store a hazardous substance?

## Further information

Links to documents about managing hazardous substances risks can be found at: [www.worksafe.govt.nz](http://www.worksafe.govt.nz)

WorkSafe has also published quick guides on managing risk, with more information on the risk management process and on how you can give workers the training that they need. You can also find more information about exposure monitoring on WorkSafe's website.