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Respiratory protective equipment – advice for businesses

Respiratory protective equipment (RPE) is a type of personal protective equipment (PPE) that protects people from breathing in substances hazardous to health. This quick guide is for persons conducting a business or undertaking (PCBUs) and it explains some factors to consider when providing your workers with RPE.

Duty to manage work-related health risks

As a PCBU you must ensure the health and safety of workers, and that others are not put at risk from your work. You must eliminate risks so far as is reasonably practicable, and where this is not possible you must minimise them. You also have a duty to monitor the health of workers and workplace conditions to ensure workers aren't injured or made ill by their work so far as is reasonably practicable.

Respiratory hazards

Airborne substances hazardous to health can be in dust, mist, vapour or gas form (for example, wood dust, welding fumes, solvent vapours). You may or may not be able to see these in the air. If workers or other people (for example, visitors) inhale these they can become unwell.

Depending on the substance, the effects can be immediate or long term. Common short-term (or acute) health effects may include headaches, forgetfulness, drowsiness, feeling dizzy and sick, mood changes, and eye and skin irritation.

Long-term (or chronic) effects may include sleep disorders, memory loss, cancer, organ damage, fertility problems and death.

Note about exposure monitoring

Under the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 (GRWM Regulations), you must ensure that no one at the workplace is exposed to a substance hazardous to health at concentrations above its prescribed exposure standard. If you are not sure whether workers or others are being exposed to a substance hazardous to health at levels above its prescribed exposure standard, you must arrange for exposure monitoring to be undertaken to determine what levels people are being exposed to. For exposure monitoring requirements, see WorkSafe's website: worksafe.govt.nz

However, even if you do not need to monitor under these regulations, you still have a primary duty under the Health and Safety at Work Act 2015 to monitor workplace conditions, so far as is reasonably practicable, if exposure to a particular health risk warrants it.

A qualified occupational hygienist or similarly competent professional must carry out the exposure monitoring. A common method of exposure monitoring involves workers wearing a sampling device while they are working. The results are compared to the relevant workplace exposure standard (WES).

For advice about exposure monitoring contact an experienced occupational health professional. For a HASANZ-registered health and safety professional, see: www.register.hasanz.org.nz

A new assessment will be needed periodically and if there are changes in the workplace or equipment, process, products or control measures.

Managing risks using RPE

When managing risks arising from respiratory hazards, you should apply the most appropriate and effective control measures that are reasonably practicable. Give preference to control measures that protect multiple people at once. Personal protective equipment (PPE) such as RPE shouldn't be the first or only control measure you consider.

For guidance on how to manage work risks and the hierarchy of controls, see WorkSafe's website: worksafe.govt.nz

Providing workers with RPE is not a quick and easy fix – it can be costly to maintain and replace. Over time, engineering control measures such as local exhaust ventilation may be more cost-effective. However, if you intend to use RPE to minimise a work risk, there are factors that you should consider when selecting the most appropriate RPE in your circumstances.

If workers are working in a dangerous environment such as a confined space, they will need to use the appropriate RPE to keep them safe. For more information on confined spaces, see the WorkSafe website.

PCBUs' duties in relation to RPE

If you use PPE such as RPE to minimise health and safety risks, you have duties you must meet:

- PCBUs must not levy or charge workers for anything done or provided for health and safety – this includes RPE.
- The PCBU who directs the carrying out of work must provide RPE to workers, unless another PCBU provides it or the worker genuinely and voluntarily chooses to provide their own RPE (and you are satisfied the RPE is suitable).
- The RPE must be suitable for the work (and its hazards), be a suitable size and fit, and be compatible with other PPE as well as reasonably comfortable.
- The RPE must be kept clean, hygienic and in good working order. It must be maintained, repaired or replaced so it continues to minimise the risk.
- PCBUs must provide information, training or instruction to workers about how to correctly use, wear, store and maintain the RPE.

You must ensure, so far as is reasonably practicable, workers or other persons at the workplace use or wear the RPE. The workers or other persons must use or wear the RPE in accordance with any information, training or reasonable instruction given by you.

Selecting suitable RPE

Types of respirators include:

- Respirators that use filters to remove contaminants from the air the wearer breathes. These can be:
 - disposable (commonly referred to as dust masks). These are designed for short term or one off use. They are only available to protect the wearer from harmful particles such as dust, fume and fibres.
 - reusable. They can come in half face and full face versions, with the wearer able to choose the correct cartridge for protection from a variety of contaminants.
- Powered air purifying respirators (PAPRs) where contaminated air is forced by a powered fan through filters to provide purified air for the wearer.
- Supplied air respirators that provide a supply of clean air from a source such as a cylinder or air compressor. When using a supplied air respirator, a competent person (like an occupational hygienist) should check the air supply. They should check that:
 - the capacity of any air service is calculated on a minimum of 170 litres per minute continuous flow for each person measured at the respirator
 - the air temperature is at a comfortable breathing temperature (15-25 degrees Celsius)
 - stale air, irritating ingredients and odours, scale, rust, water and oil mist are not present in the air pipelines
 - there is a warning device installed to warn when air quality presents a risk (if there is no secondary air supply)
 - compressors are well maintained, and oil-free if practicable
 - air intake to compressors is located in an uncontaminated atmosphere
 - air supply used in both the manufacturing process as well as for the supply of respirable air will not contaminate air used for breathing
 - levels of oxygen, carbon monoxide, carbon dioxide, oil and water present will not put the wearer of the respirator at risk.

The air quality for supplied air respirators should comply with NZS 1715. If you are unsure about air quality when using a supplied air respirator, check with a competent person.

Figure 1 shows common types of RPE.

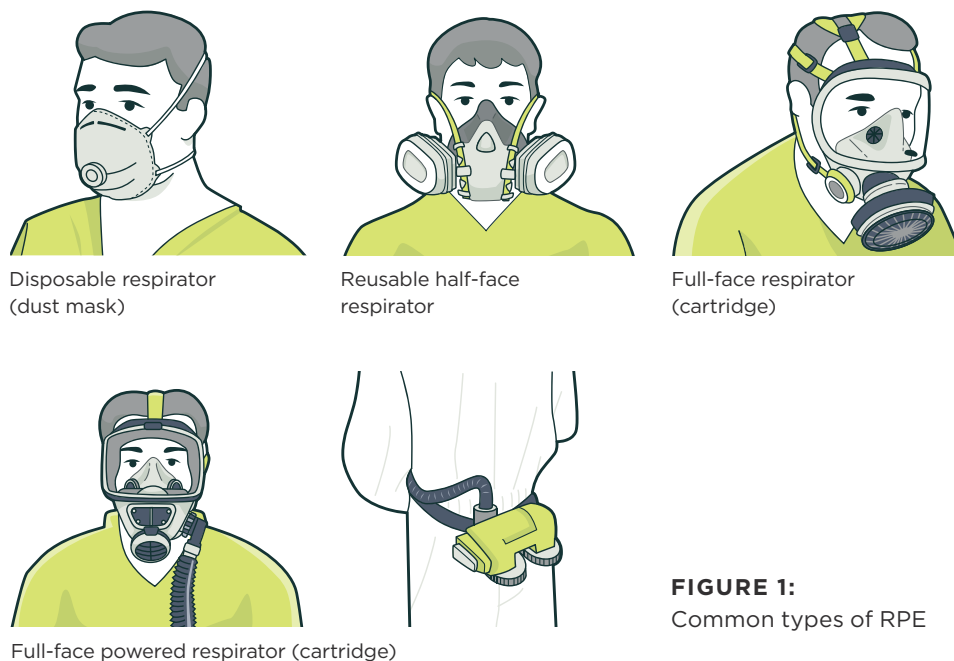


FIGURE 1:
Common types of RPE

The RPE that you provide workers must be suitable and fit the worker.

The selection of RPE will usually require expert help. When selecting RPE think about the following:

- What type of RPE will protect against the substance hazardous to health?
- Is the RPE suitable for the form of the contaminant (for example, mist, gas or solid)?
- Is the RPE suitable for the work (light or heavy work, short or long duration, confined space, ventilation)?
- The needs of each worker. For example, is the RPE the right size? Is it compatible with other PPE that workers need to wear? If the RPE needs to be worn for extended periods, what are the reasonably comfortable options?
- What control measures does the Safety Data Sheet (SDS) for the substance you are working with recommend?
- What type of respirator does the Safety Data Sheet (SDS) recommend should be used?
- You should choose a filtering respirator based on information about the airborne concentration of the contaminant. Knowing this information will ensure that you are using the correct protection factor (the degree of protection that the respirator provides).

Selecting the right RPE can be confusing; you can get advice from occupational hygienists and suppliers of RPE to make sure you provide your workers with the right protection.

Always choose RPE that complies or meets the requirements of the AS/NZS standard. For a register of verified health and safety professionals who can help you select the right RPE, see: [HASANZ register](#)

Talk to workers to get their views on which RPE to choose.

What else to know about wearing respirators

Wearing any type of respirator could physically or mentally stress workers. For example:

- Workers could feel claustrophobia, isolation or anxiety when wearing helmet, hood or full facepieces. Training programmes may help to overcome these feelings.
- Non-powered air purifying RPE can impose an extra burden on heart and lungs – especially for workers who wear RPE for long periods and suffer from:
 - emphysema
 - asthma
 - heart disease
 - anaemia
 - epileptic seizures
 - claustrophobia
 - a facial injury or dental treatment etc that affects how well the facepiece seals to the face.

If relevant, you should request workers undergo a medical examination to check that they're able to wear a respirator.

Further medical assessments may be needed (for example, if a worker reports signs or symptoms that affect the ability to use a respirator, information is gained during fit testing that may indicate it).

Filters

There is no overall rule about when filters on respirators should be changed – each situation will be different. You should ask the manufacturer, or a competent person, about when and how filters should be changed.

Using subjective tests to decide when a filter needs to be changed carries the following risks:

- Particulate filters: the filters' performance may be degraded without a noticeable increase in breathing resistance, therefore clogging will not give adequate guidance for filter replacement. Build up can be highly variable, and there may be more resistance to breathing when the air is damp.
- Gas filters: changing filters based on smell and taste tests is not always a reliable approach for several reasons. These include:
 - the ability to smell a chemical is highly variable between people
 - some people can't detect certain smells
 - some chemicals like hydrogen sulphide cause the nose to stop detecting the gas when the levels become high and dangerous
 - peoples' sense of smell may diminish temporarily (for example, when they have a cold)
 - some substances do not have an odour (for example, carbon monoxide).

Fit testing

Fit testing ensures that workers are wearing proper fitting RPE. As facial characteristics vary from person to person, it's unlikely that one model or size of RPE will fit everyone. The RPE must be appropriate for the size of the face. In addition, some types of RPE (such as negative pressure respirators – those where you suck air through a filter cartridge) must have a tight seal around the face to be effective.

Fit testing can be either qualitative (smell or taste tests) or quantitative (involving specialised equipment). Fit testing can also be a useful training exercise to teach workers how to wear their RPE correctly.

You should:

- arrange for fit testing if your workers are using respirators that need a tight seal. You can usually arrange these with your RPE supplier and fit testing should be conducted when you first provide RPE to workers. Testing is often included in the RPE price
- ensure every worker has a fit test for each piece of RPE they use
- engage a competent person to conduct a qualitative fit test
- repeat fit testing at least yearly or if there is a significant change in the wearer's facial characteristics (for example, change in weight, substantial dental work), as per recommendations in AS/NZS 1715:2009.

Note: Facial hair and stubble (even one day's growth) make it almost impossible to get a good seal. If your workers have beards you will need to consider providing other forms of RPE that do not rely on a tight face fit. Jewellery, glasses, long hair and makeup can also compromise face fit.

Using RPE

Workers should visually check their RPE for signs of damage before each use. Workers must tell you of any RPE damage or defect that they become aware of. Workers must tell you when they become aware the RPE needs to be cleaned or decontaminated.

RPE should not be taken off when inside a hazardous area – even if only for a short time, and should be put on before entering the hazardous work area.

Respirators that need a tight fit

If your workers are using RPE that needs a tight fit, ensure they check it fits properly before entering a hazardous area. There are two 'fit checks' they should do.



Positive pressure fit check

1. Block the exhalation valve with the palm of your hand.
2. Gently breathe out and hold for about 10 seconds.
3. Check to see if the face-piece is bulging slightly.
4. If the face-piece remains bulging and there are no more leaks between the face and face-piece, the respirator is properly fitted. If you detect leaks, readjust the straps and check again for a proper fit.



Negative pressure fit check

1. Block the cartridges with the palms of your hands.
2. Gently inhale and hold for about 10 seconds.
3. Check to see if the face-piece is collapsing slightly.
4. If the face-piece remains collapsed and there are no more leaks between the face and face-piece, the respirator is properly fitted. If you detect leaks, readjust the straps and check again for a proper fit.

FIGURE 2: Fit checking

If the wearer's safety glasses fog up when wearing a half-face respirator, this indicates there's a leak at the top of the respirator.

Training

Your workers must be trained to use and look after (for example, clean, maintain and store) their RPE properly. Get a competent person such as a consultant, an experienced in-house worker or a representative from a RPE manufacturer or supplier to deliver the training.

Training should refer to the manufacturer's instructions and cover the following topics:

- the hazards, risks and effects of exposure to the harmful substance, and why workers need RPE
- the likely health effects if RPE is not worn
- how it works
- why fit testing is necessary
- how to wear and fit check RPE
- when and how to replace filters/cartridges
- how to clean and store RPE (**Note:** Disposable RPE should not be cleaned.)
- workers' health and safety responsibilities.

Workers should be told what the limitations of the RPE are.

Regularly review training to ensure worker awareness remains high.

Health monitoring

Health monitoring is a way to check if the health of workers is being harmed from exposure to hazards while carrying out work, and aims to detect early signs of ill-health or disease. Health monitoring can show if control measures are working effectively. Monitoring does not replace the need for control measures to minimise or prevent exposure.

The GRWM Regulations require health monitoring in certain circumstances. You must monitor workers' health when:

- a worker is carrying out ongoing work involving a substance hazardous to health (if that substance is specified in a safe work instrument as requiring health monitoring) and
- there is a serious risk to workers' health because of exposure to that substance.

For health monitoring requirements, see WorkSafe's website: [worksafe.govt.nz](https://www.worksafe.govt.nz)

However, even if you do not need to monitor under these regulations, you still have a primary duty under the Health and Safety at Work Act 2015 to monitor worker health, so far as is reasonably practicable, if exposure to a particular health risk warrants it. Health monitoring is important for workers who wear PPE/RPE to check that they're not being exposed to a health risk.

Talk to your workers to get their views about health monitoring.

For advice about health monitoring contact an experienced occupational health professional.

Recording and reviewing your respiratory protection programme

We recommend you keep written records about your respiratory protection programme (which covers the selection, training and use of RPE, and any health monitoring).

Your respiratory protection programme needs to be reviewed regularly to check that your requirements are still being met. Keep track of all changes made as a result of the reviews.

PCBU checklist for your respiratory protection programme

- Have you undertaken a risk assessment for your work?
- Have you put control measures in place?
- Do you have a system for reviewing risks and ensuring the control measures are working?
- Do you involve your workers in risk management?
- Do your workers know about the risks associated with the substances they work with or that are generated by the work?
- Have you assessed the nature of the risks identified and had a qualified person determine the exposure?
- Have you carried out fit testing for your workers who will be wearing RPE?
- Have you trained workers on the correct use of the RPE (with reference to manufacturer's guidelines)?
- Do workers know when to change gas or particulate cartridges? (if relevant)
- Have you documented this in their personnel record?
- Do you have a process in place for the issue and maintenance of RPE?
- Have you made somebody responsible for your respiratory programme?

Further information

- WorkSafe's quick guide *Respiratory Protective Equipment - Advice for Workers*.
- For exposure and health monitoring requirements, see WorkSafe's website: [worksafe.govt.nz](https://www.worksafe.govt.nz)