Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements

Code of Practice

2022

Workplace Health and Safety Queensland
worksafe.qld.gov.au

Queensland Government

This Queensland code of practice has been approved by the Minister for Education and Minister for Industrial Relations under section 274 of the *Work Health and Safety Act 2011* and will commence on 1 May 2023.

PN12792

Contents

Foreword

The *Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements Code of Practice 2022* is an approved code of practice under section 274 of the *Work Health and Safety Act 2011* (WHS Act).

An approved code of practice is a practical guide to achieving the standards of health, safety and welfare required under the WHS Act and the Work Health and Safety Regulation 2011 (WHS Regulation).

Under section 26A of the WHS Act, a person conducting a business or undertaking (PCBU) must:

- comply with an approved code of practice; or
- manage hazards and risks arising from the work carried out as part of the business or undertaking in a way that is different to the code but provides an equivalent or higher standard of work health and safety than the standard required in the code.

A code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in the WHS Act, in relation to the subject matter of the code. Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks which may arise. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and the WHS Regulation. Courts may regard a code of practice as evidence of what is known about a hazard, risk or control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

An inspector may refer to an approved code of practice when issuing an improvement notice. This may include issuing an improvement notice for failure to comply with a code of practice where equivalent or higher standards of work health and safety have not been demonstrated.

Code terminology

This code includes references to the legal requirements under the WHS Act and WHS Regulation. These references are not exhaustive and are included for convenience only. They should not be relied on in place of the full text of the WHS Act or the WHS Regulation.

The words '**must**', '**requires**' or '**mandatory**' indicate that a legal requirement exists that must be complied with.

The world '**should**' is used in this code to identify the standard required in this code. PCBUs can only manage the identified hazard or risk in a different way if doing so provides an equivalent or higher standard of work health and safety.

The word '**may**' is used to identify an optional course of action.

References to other legislation

This code includes references to the *Electrical Safety Act 2002* (ES Act) and Electrical Safety Regulation 2013 (ES Regulation). These references are not exhaustive and are included for information only. They should not be relied on in place of the full text of the ES Act or the ES Regulation. While this code includes information about electrical safety it is not an approved code under the ES Act.

Scope and application

This Code provides practical guidance for persons conducting a business or undertaking on how to manage risks associated with respirable crystalline silica (RCS) exposure in:

- construction work
- manufacturing of construction elements.

Within construction work and the manufacturing of construction elements, the Code concerns tasks that involve:

- using materials that contain 1 per cent or more crystalline silica content
- generate RCS, or make RCS airborne.

The Code applies to all workplaces covered by the WHS Act, where construction work or manufacturing of construction elements takes place.

Meaning of construction work

The definition of construction work is set down in section 289 of the WHS Regulation.

WHS Regulation section 289(1): Construction work means any work carried out in connection with the construction, alteration, conversion, fitting-out, commissioning, renovation, repair, maintenance, refurbishment, demolition, decommissioning or dismantling of a structure.

WHS Regulation section 289(2): Construction work includes the following:

a) any installation or testing carried out in connection with an activity mentioned in subsection (1);

b) the removal from the workplace of any product or waste resulting from demolition;

c) the prefabrication or testing of elements, at a place specifically established for the construction work, for use in construction work;

d) the assembly of prefabricated elements to form a structure, or the disassembly of prefabricated elements forming part of a structure;

e) the installation, testing or maintenance of an essential service in relation to a structure;

f) any work connected with an excavation;

g) any work connected with any preparatory work or site preparation (including landscaping as part of site preparation) carried out in connection with an activity

mentioned in subsection (1);

h) an activity mentioned in subsection (1), that is carried out on, under or near water, including work on buoys and obstructions to navigation.

Note: Any construction work that includes a risk of exposure to RCS is **high risk construction work**, according to section 291(l) of the WHS Regulation. That is because it is carried out in an area that may have a contaminated atmosphere.

Meaning of construction elements - manufacturing

This Code applies to the manufacturing of elements for use in construction work, regardless of where the manufacturing is undertaken (i.e. not limited to the manufacturing of elements on a construction site).

Relevant construction elements or materials include, but are not limited to:

- cement, concrete and aggregates, including precast concrete products such as fibre-cement sheeting
- bricks, tiles, blocks, pylons and pavers
- grout, mortar, asphalt, sand and stone
- wall panels
- geosynthetics.

This Code does not cover the manufacturing of tools or plant for use in construction.

Note: The scope of this Code does not include the engineered and natural stone benchtop industry. The *Managing respirable crystalline silica dust exposure in the stone benchtop industry Code of Practice* provides guidance on how to manage the risk of RCS exposure in this industry.

See Appendix 1 for a definition of key terms.

1. Introduction

1.1 What is respirable crystalline silica (RCS)?

Crystalline silica[1] is a common mineral found in many building materials, such as:

- bricks
- concrete and cement
- engineered stone
- natural stone (e.g. granite or sandstone)
- fibre cement products.

Working with materials that contain crystalline silica can make (or generate) a dangerous dust called **respirable crystalline silica** (RCS).

RCS can be generated when working with these materials, including tasks such as cutting, sawing, grinding, drilling, polishing, scabbling and crushing.

Other tasks like dry sweeping or using compressed air can disturb settled dust containing RCS and make it airborne.

> **Note:** Respirable crystalline silica (RCS) is a hazardous chemical. A PCBU must manage risks to health and safety associated with using, handling, generating or storing a hazardous chemical at a workplace.
>
> Refer to Appendix 1 - Dictionary for more information on what a hazardous chemical is under WHS Regulation.

1.2 What are the health effects of RCS?

Respirable crystalline silica (RCS) is dangerous because:

- it is easy to breathe in RCS
- RCS is too small to be seen by eye
- RCS can stay in the air for several hours (even over 24 hours, when there is no wind or ventilation).

Breathing in RCS can lead to serious lung diseases, including silicosis and lung cancer. Over time, these lung diseases can cause permanent disability and death.

There are three types of silicosis:

- *acute silicosis* is very rare and results from exposure to very short-term and very large amounts of RCS (e.g. less than one year)
- *accelerated silicosis* results from short-term large amounts of inadequately protected exposure to RCS (1–10 years exposure)
- *chronic silicosis* results from long term exposure (10+ years of exposure) to low levels of RCS.

[1] Different forms of crystalline silica include quartz, cristobalite and tridymite. Amorphous silica, as found in glass, is not associated with silicosis. See Appendix 1 - Dictionary.

The symptoms of silicosis include:

- shortness of breath
- severe cough
- weakness.

These symptoms may not appear for many years after breathing in RCS. That is why it is so important to eliminate or minimise exposure to RCS in the workplace as much as is reasonably practicable.

1.3 What is the workplace exposure standard for RCS?

> **WHS Regulation section 49:** A person conducting a business or undertaking (PCBU) at a workplace must ensure that no person at the workplace is exposed to a substance or mixture in an airborne concentration that exceeds the exposure standard for the substance or mixture.

A **workplace exposure standard (WES)** is a legal requirement for workplaces, to limit how much people can be exposed to dangerous materials, like respirable crystalline silica (RCS).

The WES for RCS[2] is 0.05 milligrams per cubic metre (mg/m^3) averaged over an eight-hour period (8-h time-weighted average or TWA).

This is less than the amount of dust shown next to the five-cent piece below.

Figure 1: size representation of RCS dust particle (source: WHSQ)

Using the right controls in the workplace can reduce the amount of RCS that people are exposed to. The aim of using controls must be to:

- ensure nobody in the workplace is exposed to a level of RCS higher than the **WES**
- remove or reduce the risk from RCS **so far as is reasonably practicable.**

Refer to Section 3.4 for more information on what is reasonably practicable.

> **Note:** The requirement to make sure nobody at the workplace is exposed to a level of RCS that exceeds the WES is not subject to a test of 'reasonably practicable'.

Further information on exposure standards is available at safeworkaustralia.gov.au[3].

[2] There are three substances (Cristobalite, Quartz and Tridymite) classified as respirable crystalline silica by the Workplace Exposure Standards for Airborne Contaminants.
[3] https://www.safeworkaustralia.gov.au/doc/guidance-interpretation-workplace-exposure-standards-airborne-contaminants

1.4 What are the prohibitions on silica in the workplace?

Uncontrolled dry cutting or processing of materials that contain 1 per cent or more crystalline silica

As stated in Section 1.3, a PCBU at a workplace must make sure that nobody at the workplace is exposed to respirable crystalline silica (RCS) at a level higher than the workplace exposure standard.

That is why it is so important to use controls to prevent RCS getting into the air, and to stop RCS from getting into the air.

It is highly likely that the workplace exposure standard would be exceeded when:

- using a power tool to cut, crush, scabble, grind, saw, sand or polish a material (also known as **processing**) that contains 1 per cent or more crystalline silica
- no controls are being used, including the use of water to suppress RCS.

For that reason, **PCBUs must not allow workers to undertake uncontrolled dry cutting or processing of materials that contain 1 per cent or more crystalline silica.**

> **Note:** Refer to *4 - Other tasks with low risk* in Appendix 4 for examples of tools that avoid high-energy processing when working with materials that contain 1 per cent or more crystalline silica (such as power shears).

Use of free silica for abrasive blasting

The WHS Regulation prohibits and restrict the use of some hazardous chemicals as abrasive material in an abrasive blasting process.

This includes any substance that contains greater than 1 per cent free silica (crystalline silica).

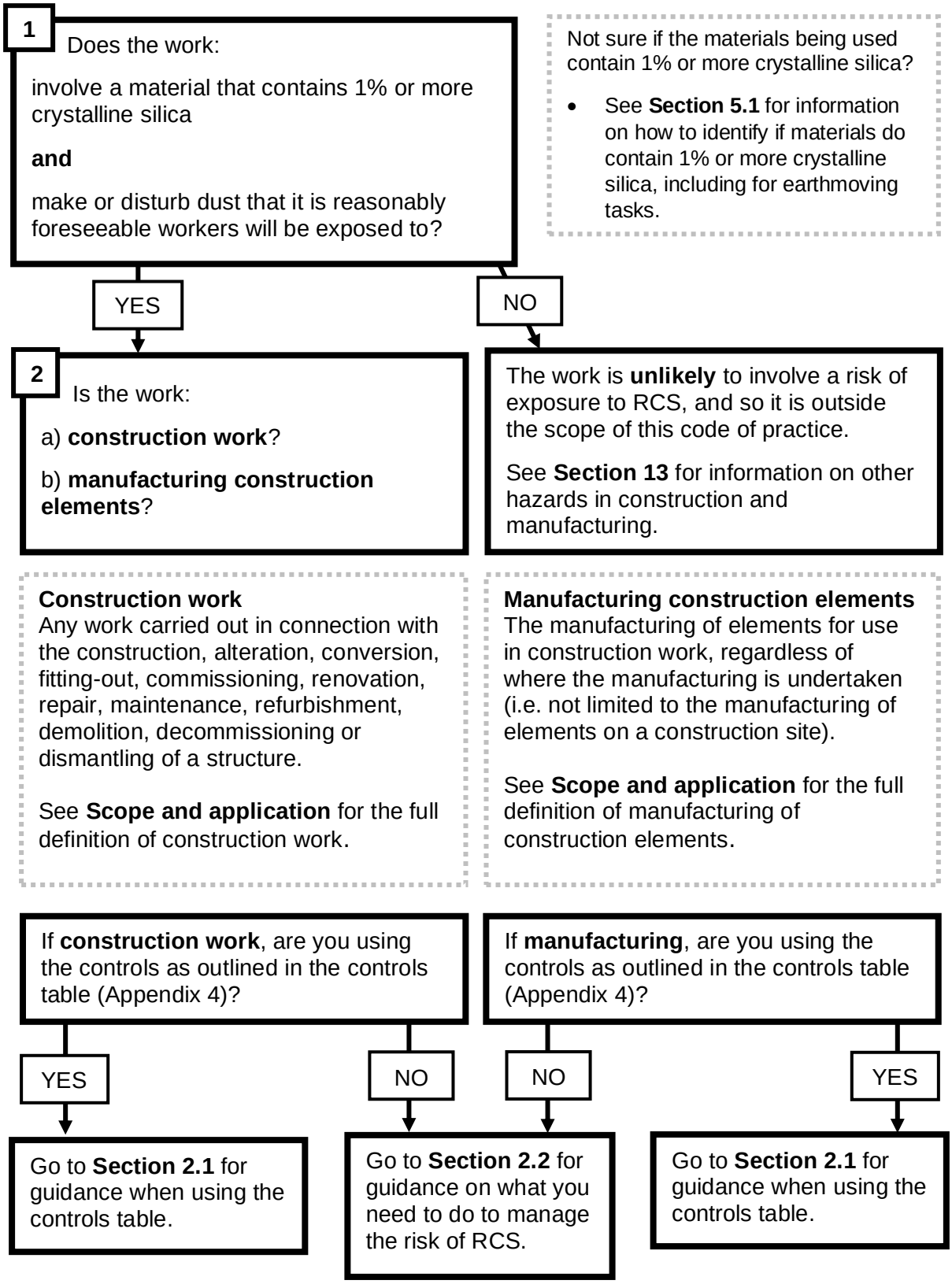
As such, **PCBUs must not use, or direct or allow a worker to use any material with >1 per cent crystalline silica for abrasive blasting.**

For further information on restrictions and controls related to abrasive blasting, please refer to the *Abrasive blasting Code of Practice*.

https://www.safeworkaustralia.gov.au/system/files/documents/1912/workplace-exposure-standards-airborne-contaminants.pdf

2. Code of Practice - what to do

The flowchart below outlines the standard required by this Code of Practice. Follow it step-by-step to find out how to manage the risk of RCS for the work you are doing.

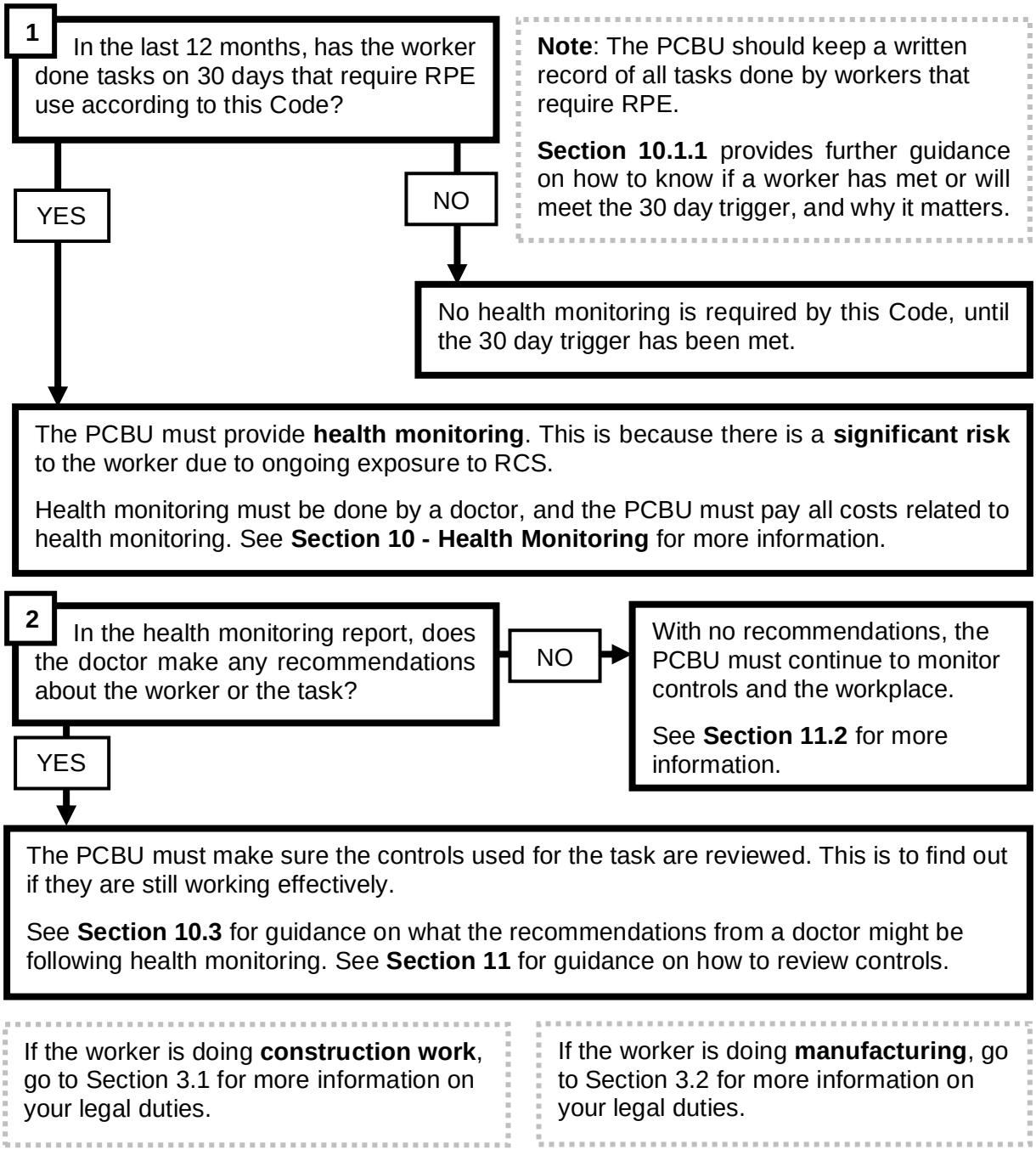


2.1 Using the controls table - flowchart

The controls table in Appendix 4 outlines what controls you should be using for different tasks. It also says when respiratory protective equipment (RPE) should be worn. This can depend on how long the task takes, and whether you are in an enclosed area when doing the work.

Section 6.1 provides guidance for reading and using the controls table, including to find out if workers are required to wear RPE for the work they are doing.

The below flowchart provides guidance on the triggers for health monitoring.



2.2 Not using the controls table - flowchart

If you are not using the controls table in Appendix 4, the flowchart below will help you to choose the right controls. It also provides guidance on the triggers for health monitoring and air monitoring.

1 To select the right controls, follow the **hierarchy of controls**.

This means you must first seek to **eliminate** the risk (refer Section 7.1). This can be done by using a material that does not contain crystalline silica. Or by planning the work so that the task that makes dust is not needed.

If you **eliminate** the risk in this way, the work is unlikely to involve a risk of exposure to RCS. As such, you do not need to follow the rest of this flowchart.

If you are unable to eliminate the risk, you must choose controls in the following order, so far as is **reasonably practicable** (refer Appendix 1 - Dictionary for a definition):

1. **Substitute** (refer Section 7.2)
2. **Isolate** (refer Section 7.3)
3. **Engineering** controls (refer Section 7.4)

If a risk still remains, you must use additional controls to reduce the risk further:

4. **Administrative** controls (refer Section 7.5)
5. **Personal protective equipment**, including **RPE** (refer Section 7.6)

Steps 2 and 3 of this flowchart explain how to find out if a risk still remains.

2 To find out if the chosen controls are effective, the PCBU must:

a) conduct **air monitoring**

or

b) use **statistically valid exposure data** for the controls you have chosen, and the work being done.

This will tell the PCBU if the levels of RCS in the breathing zone of the worker exceed the **workplace exposure standard**.

This will determine if RPE is needed, and what kind of RPE is appropriate.

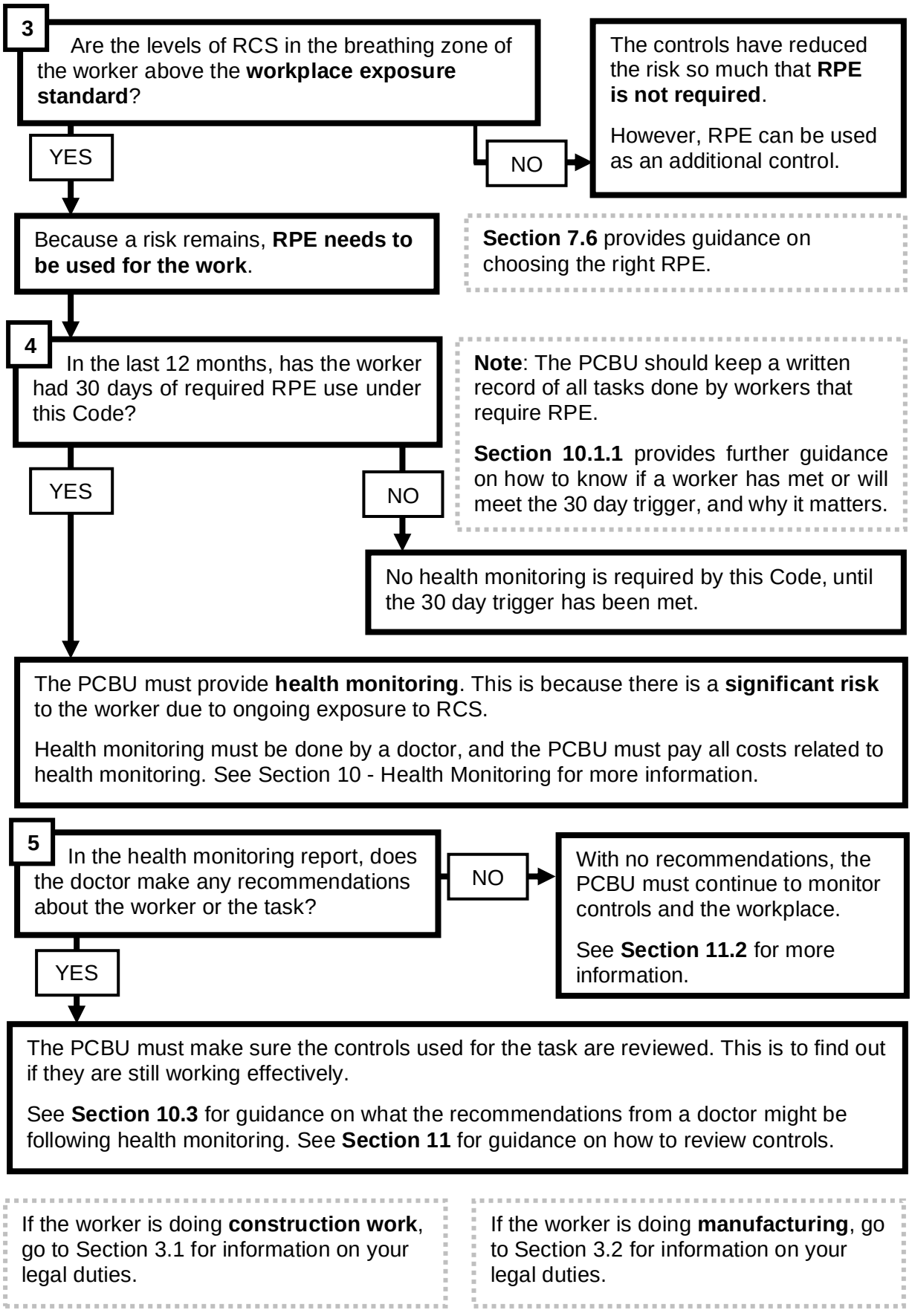
Section 9 - Air monitoring outlines:

- **who** should do the air monitoring
- **how** the air monitoring should be done

Section 9 tells you how to know if the workplace exposure standard has been exceeded.

Section 9.3 explains what statistically valid exposure data is, under this Code.

Continue on to the next page for guidance on RPE and health monitoring.


3
Are the levels of RCS in the breathing zone of the worker above the **workplace exposure standard**?
YES
NO
The controls have reduced the risk so much that **RPE is not required**.
However, RPE can be used as an additional control.
Because a risk remains, **RPE needs to be used for the work**.
Section 7.6 provides guidance on choosing the right RPE.
4
In the last 12 months, has the worker had 30 days of required RPE use under this Code?
YES
NO
Note: The PCBU should keep a written record of all tasks done by workers that require RPE.
Section 10.1.1 provides further guidance on how to know if a worker has met or will meet the 30 day trigger, and why it matters.
No health monitoring is required by this Code, until the 30 day trigger has been met.
The PCBU must provide **health monitoring**. This is because there is a **significant risk** to the worker due to ongoing exposure to RCS.
Health monitoring must be done by a doctor, and the PCBU must pay all costs related to health monitoring. See Section 10 - Health Monitoring for more information.
5
In the health monitoring report, does the doctor make any recommendations about the worker or the task?
NO
With no recommendations, the PCBU must continue to monitor controls and the workplace.
See **Section 11.2** for more information.
YES
The PCBU must make sure the controls used for the task are reviewed. This is to find out if they are still working effectively.
See **Section 10.3** for guidance on what the recommendations from a doctor might be following health monitoring. See **Section 11** for guidance on how to review controls.
If the worker is doing **construction work**, go to Section 3.1 for information on your legal duties.
If the worker is doing **manufacturing**, go to Section 3.2 for information on your legal duties.

3. Duties in construction and manufacturing

The WHS Act and WHS Regulation include a number of duties that people in the workplace must follow to manage risks to health and safety.

These include specific requirements for people in construction work, and in manufacturing.

The tables in Section 3.1 and Section 3.2 list the key duties related to managing the risk of exposure to RCS. Section 3.3 outlines relevant duties for importers and suppliers.

> **Note:** This section is focused on the risk of exposure to RCS and does not include every health and safety duty. Refer to Section 13 for further information on how to manage other hazards in construction and manufacturing.

3.1 Duties in construction work

Who	Duties	Provisions
Person conducting a business or undertaking (PCBU)	Make sure people at the workplace (including workers, volunteers and others) are not exposed to health and safety risks that arise from the work of the business or undertaking. – so far as is reasonably practicable	WHS Act s.19
	Must manage risks associated with the carrying out of construction work	WHS Regulation s.297
	Must manage risks to health and safety associated with using, handling, generating or storing a hazardous chemical (such as RCS) at work	WHS Regulation s.351
	Identify reasonably foreseeable hazards that could lead to risks to health and safety	WHS Regulation s.34
	Eliminate health and safety risks, and if that is not reasonably practicable, minimise those risks using hierarchy of controls – so far as is reasonably practicable	WHS Regulation s.35–36
	Maintain controls used so that they remain effective	WHS Regulation s.37
	Review controls used to maintain a work environment that is without risks to health and safety – so far as is reasonably practicable	WHS Regulation s.38
	Make sure no person at the workplace is exposed to RCS at a level above the workplace exposure standard	WHS Regulation s.49
	Make sure air monitoring is carried out if: – they are not certain, on reasonable grounds, the workplace exposure standard has been exceeded – monitoring is needed to determine if there is a risk to health	WHS Regulation s.50
	Make sure health monitoring is carried out if there is an ongoing significant risk to a worker's health from exposure to RCS	WHS Regulation s.368

	Make sure workers are provided with RPE, if RPE is required.	WHS Regulation s.44
	Make sure a safe work method statement is prepared for high risk construction work (see Section 3.2)	WHS Regulation s.299
Principal contractors	Prepare a written WHS management plan for the workplace, before work begins	WHS Regulation s.309
	Review and update the WHS management plan as necessary, so that it remains up to date	WHS Regulation s.311
	Inform people carrying out construction work of the content of the WHS management plan, including any revisions made	WHS Regulation s.310
	Make sure a copy of the WHS management plan is kept until the project is complete, or longer if there is an incident – specific requirements included in the WHS Regulation	WHS Regulation s.313
	Get a copy of the safe work method statement before the high risk construction work begins (see Section 3.2)	WHS Regulation s.312
	Put in place arrangements to make sure PCBU meets their duties, including to: – Make sure workers are provided with RPE, if RPE is required. – Make sure no person at the workplace is exposed to RCS at a level above the workplace exposure standard – Make sure air monitoring is carried out if o they are not certain, on reasonable grounds, the workplace exposure standard has been exceeded o monitoring is needed to determine if there is a risk to health	WHS Regulation s.314 WHS Regulation s.44 WHS Regulation s.49 WHS Regulation s.50
	Manage risks to health and safety associated with storage, movement and disposal of construction materials and waste at the workplace	WHS Regulation s.315
Officers, such as company directors	Exercise due diligence to make sure the PCBU meet their duties under the WHS Act. – Further information on due diligence is provided in Appendix 1 - Dictionary	WHS Act s.27
Workers	Take reasonable care for your own health and safety	WHS Act s .28
	Take reasonable care that your acts or omissions do not adversely affect the health and safety of others	WHS Act s. 28
	Comply, so far as you are reasonably able, with any reasonable instruction that is given by the PCBU to allow them to comply with the WHS Act e.g. taking part in health monitoring	WHS Act s .28
	Co-operate with any reasonable policy/procedure of the PCBU relating to health or safety at the workplace that has been notified to workers (e.g. reporting any health and safety issues, wearing RPE, and using the right controls)	WHS Act s .28

Other persons at the workplace	Take reasonable care for your own health and safety	WHS Act s.29
	Take reasonable care that your acts or omissions do not adversely affect the health and safety of others	WHS Act s.29
	Comply, so far as you are reasonably able, with any reasonable instruction that is given by the PCBU to allow them to comply with the WHS Act	WHS Act s.29

See Appendix 1 - Dictionary for more information on the different roles in the workplace.

See Section 3.5 for more information on determining what is 'reasonably practicable'.

3.1.1 Planning - Safe work method statement

WHS Regulation section 299: A PCBU that includes the carrying out of high risk construction work must, before high risk construction work commences, ensure that a safe work method statement for the proposed work:

a) is prepared; or

b) has already been prepared by another person.

A safe work method statement must:

a) identify the work that is high risk construction work; and

b) state hazards relating to the high risk construction work and risks to health and safety associated with those hazards; and

c) describe the measures to be implemented to control the risks; and

d) describe how the control measures are to be implemented, monitored and reviewed.

A safe work method statement must:

a) be prepared taking into account all relevant matters, including:

   i. circumstances at the workplace that may affect the way in which the high risk construction work is carried out;

   ii. if the high risk construction work is carried out in connection with a construction project - the WHS management plan that has been prepared for the workplace; and

b) be set out and expressed in a way that is readily accessible and understandable to persons who use it.

The WHS Regulation requires a safe work method statement (SWMS) to be prepared before carrying out construction work that includes a risk of exposure to respirable crystalline silica (RCS).

That is because it is defined as **high risk construction work** under WHS Regulation, section 299(1).

The purpose of the SWMS is to:

- identify the workplace hazards related to RCS

- identify the risks to health and safety from RCS
- describe how the risk of exposure to RCS will be managed, including:
  - what controls will be used
  - how the controls will be used.

Note: A sample Safe Work Method Statement (SWMS) is provided in Appendix 2.

Consultation

Workers and their health and safety representatives, if any, must be consulted when preparing SWMS. If there are no workers engaged at the planning stage, consultation must occur with workers when the SWMS is first made available to workers (e.g. during workplace-specific training or a toolbox talk). Workers and their health and safety representatives, if any, must also be consulted when a SWMS is reviewed.

A SWMS may include details of workers who have been consulted on the content of the SWMS, the date the consultation occurred and the signature of each worker acknowledging their participation in developing the SWMS.

3.2 Duties in manufacturing of construction elements

Who	Duties	Provisions
Person conducting a business or undertaking (PCBU)	Make sure people at the workplace (including workers, volunteers and others) are not exposed to health and safety risks that arise from the work of the business or undertaking. so far as is reasonably practicable	WHS Act s.19
	Must manage risks to health and safety associated with using, handling, generating or storing a hazardous chemical (such as RCS) at work	WHS Regulation s.351
	Identify reasonably foreseeable hazards that could lead to risks to health and safety	WHS Regulation s.34
	Eliminate health and safety risks, and if that is not reasonably practicable, minimise those risks using hierarchy of controls so far as is reasonably practicable	WHS Regulation s.35–36
	Maintain controls used so that they remain effective.	WHS Regulation s.37
	Review controls used to maintain a work environment that is without risks to health and safety so far as is reasonably practicable	WHS Regulation s.38
	Make sure no person at the workplace is exposed to RCS at a level above the workplace exposure standard	WHS Regulation s.49
	Make sure air monitoring is carried out if: – they are not certain, on reasonable grounds, the workplace exposure standard has been exceeded – monitoring is needed to determine if there is a risk to health	WHS Regulation s.50

	Make sure health monitoring is carried out if there is an ongoing significant risk to a worker's health from exposure to RCS	WHS Regulation s.368
	Make sure workers are provided with RPE, if RPE is required.	WHS Regulation s.44
Manufacturers	Make sure the substance is manufactured to be without risks to health and safety, with consideration for the designed use of the substance – so far as is reasonably practicable	WHS Act s.23(2)
	Carry out any testing or analysis needed to make sure the substance is manufactured to be without risks to health and safety (or arrange the testing or analysis)	WHS Act s.23(3)
	Provide adequate information to customers about: – the designed use of the substance – results of any testing or analysis, including any hazardous properties – any conditions or controls needed to ensure the substance is without risks to health and safety when used as designed.	WHS Act s.23(4)(5)
	Prepare a safety data sheet, if the manufactured substance is a hazardous chemical – Further information on hazardous chemicals is provided in Appendix 1 - Dictionary – Further information on safety data sheets is provided in the Preparation of safety data sheets for hazardous chemicals Code of Practice	WHS Regulation s.330
Officers, such as company directors	Exercise due diligence to make sure the PCBU meet their duties under the WHS Act. – Further information on due diligence is provided in Appendix 1 - Dictionary	WHS Act s.27
Workers	Take reasonable care for your own health and safety	WHS Act s.28
	Take reasonable care that your acts or omissions do not adversely affect the health and safety of others	WHS Act s.28
	Comply, so far as you are reasonably able, with any reasonable instruction that is given by the PCBU to allow them to comply with the WHS Act e.g. take part in health monitoring when instructed	WHS Act s.28
	Co-operate with any reasonable policy/procedure of the PCBU relating to health or safety at the workplace that has been notified to workers (e.g. reporting any health and safety issues, wearing RPE, and using the right controls)	WHS Act s.28
Other persons at the workplace	Take reasonable care for your own health and safety	WHS Act s.29
	Take reasonable care that your acts or omissions do not adversely affect the health and safety of others	WHS Act s.29
	Comply, so far as you are reasonably able, with any reasonable instruction that is given by the PCBU to allow them to comply with the WHS Act	WHS Act s.29

See Appendix 1 - Dictionary for more information on the different roles in the workplace.

See Section 3.5 for more information on determining what is ‘reasonably practicable’.

Providing information on construction elements/materials

WHS Act section 23(4): The manufacturer must give adequate information to each person to whom the manufacturer provides the substance concerning:

a) each purpose for which the substance was designed or manufactured; and

b) the results of any calculations, analysis, testing, or examination, including any hazardous properties of the substance identified by testing; and

c) any conditions necessary to ensure that the substance is without risks to health and safety when used for a purpose for which it was designed or manufactured.

Manufacturers must provide adequate information with construction materials/elements about how conditions are needed to make sure they can be used safely.

This should include information on whether the construction element/material contains **1 per cent or more crystalline silica.** If the construction element/ material does contain 1 per cent or more crystalline silica, then the manufacturers should also make sure the following information is included:

- information on the hazardous properties of RCS
- information on the health risks of RCS
- information on how to manage these risks in the workplace, such as:
    - a statement that the Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements Code of Practice should be consulted for further information on how to use the construction element/material safely.

This information may be provided in:

- technical or safety data sheets
- product labels fixed to each bundle / pallet / packet; or
- similar documents.

If the manufacturer is not sure whether the construction element/material contains **1 per cent or more crystalline silica**, they must carry out, or arrange the carrying out of, any calculations, analysis, testing or examination that may be necessary to ensure (so far as is reasonably practicable) that the material does or does not contain this much crystalline silica.

If a person using, handling or storing the substance at a workplace asks for information on the substance, the manufacturer must provide any relevant amendments or updates to the included information (so far as is reasonably practicable).

Safety data sheets

WHS Regulation section 330: A manufacturer or importer of a hazardous chemical must prepare a safety data sheet for the hazardous chemical:

a) before first manufacturing or importing the hazardous chemical; or

b) if that is not practicable - as soon as practicable after first manufacturing or importing the hazardous chemical and before first supplying it to a workplace.

If the construction element/material is a hazardous chemical, the manufacturer must prepare a safety data sheet.

Further information on safety data sheets is provided in Section 3.4 of this Code and in the Preparation of safety data sheets for hazardous chemicals Code of Practice.

3.2.1 Planning - RCS dust control plan

WHS Regulation section 34: A duty holder must, in managing risks to health and safety, must identify reasonably foreseeable hazards that could give rise to risks to health and safety.

WHS Regulation section 351: A PCBU must manage risks to health and safety associated with using, handling, generating or storing a hazardous chemical at a workplace.

Under section 34 and section 351 of the WHS Regulation, duty holders must identify hazards involving a risk of exposure to RCS. For that reason, PCBUs must plan the manufacturing of construction materials to identify sources of RCS and choose the right controls.

The PCBU can prepare this plan as part of a WHS risk management plan or document, or they can prepare a specific RCS dust control plan.

The plan for manufacturing construction materials should include information on how you intend to:

- eliminate or minimise the amount of RCS being made and released into the air
- prevent RCS being breathed in by workers
- clean up any RCS, in dust, wet slurry or any other waste
- provide facilities for workers to clean up after work.

This information should include:

- a statement that the product(s) being used contains 1 per cent or more crystalline silica
- all sources of RCS in the workplace
- the controls that will be used:
    - if you are using the controls outlined for the task in **Appendix 4 - Controls table**, a record should be kept of the controls used; including RPE.
    - if you are not using the controls outlined for the task in **Appendix 4 - Controls table**, follow the hierarchy of controls (Refer to Section 2.2).
- how the controls will be included in daily shift routines, such as:
    - tool box talks
    - pre-start checks

    - daily cleaning of work areas
- the cleaning of work areas that may contain RCS
- the safe disposal of RCS
- the routine checking of systems and controls (Refer to Section 11)
- how air monitoring will be used (Refer to Section 9)
- how workers are told about risks from RCS
- how workers can report risks from RCS.

Note: PCBUs should be prepared to produce the plan or document at an inspector's request.

Note: A sample RCS dust control plan is provided in Appendix 3.

Consultation

Under section 49(1)(a) of the WHS Act, workers must be consulted when identifying hazards and assessing risks to health and safety arising from work carried out, or to be carried out by the business or undertaking. This means a PCBU must consult with workers when developing an RCS dust control plan, or when providing the above information in another workplace plan or document.

The plan should be made available to a medical practitioner (e.g. a doctor) if they are carrying out health monitoring. Refer to Section 10 - Health monitoring for more information.

3.3 Duties on importers and suppliers

WHS Act section 24-25: A PCBU who imports or supplies a substance must ensure, so far as is reasonably practicable, that a substance to be used at a workplace is without risks to health and safety of workers who:

a) use the substance for a purpose for which it is designed or manufactured; or

b) handle or store the substance at the workplace; or

c) carry out any foreseeable activity at the workplace relating to the proposed use, handling or disposal of the substance; or

d) are in the vicinity of a workplace and who are exposed to the substance or whose health and safety may be affected by a use or activity mentioned above.

The importer or supplier must carry out any analysis or testing necessary to meet their duty and must give adequate information to each person the substance is provided to about:

a) the purpose for which the substance has been designed and manufactured;

b) the results of any calculations and analysis, testing in relation to the substance, including any hazardous properties;

c) any conditions necessary to ensure the substance is without risks to health and safety when used for the purpose for which it was manufactured.

Importers and suppliers must give adequate information with construction materials / elements about how they can be used safely.

This should include information on whether the construction element/material contains **1 per cent or more crystalline silica**.

If the construction element/ material does contain 1 per cent or more crystalline silica, then the importers and suppliers should also make sure the following information is given to everyone the construction elements are provided to:

- information on the hazardous properties of RCS
- information on the health risks of RCS
- information on how using tools or plant to cut, crush, scabble, grind, saw, sand or polish the material (also known as processing) can generate RCS
- information on how to manage these risks in the workplace, such as:
    - a statement that the Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements Code of Practice should be read for further information on how to use the construction element/material safely.

This information may be provided in:

- technical or safety data sheets
- product labels fixed to each bundle / pallet / packet; or
- similar documents.

Importers and suppliers of materials that contain crystalline silica should get this information from the manufacturer, and then pass the information on when supplying the construction element/material.

When requested, the importer or supplier must provide any relevant amendments or updates to the included information (so far as is reasonably practicable).

If the importer or supplier is not sure whether the construction element/material contains **1 per cent or more crystalline silica**, they must carry out, or arrange the carrying out of, any calculations, analysis, testing or examination that may be necessary to ensure (so far as is reasonably practicable) that the material does or does not contain this much crystalline silica.

3.4 Safety data sheets

WHS Regulation section 329: The manufacturer or importer of a substance, mixture or article must, before first supplying it to a workplace:

a) determine whether the substance, mixture or article must, before first supplying it to a workplace;

b) if the substance, mixture or article is a hazardous chemical - ensure that the hazardous chemical is correctly classified under schedule 9, part 1.

WHS Regulation, Schedule 7, (2)(h): A safety data sheet for a hazardous chemical must state the following information about the chemical:

h) Section 8: Exposure controls and personal protection

Before supplying a construction element/material to a workplace, the manufacturer or importer must first determine whether the construction element/material is a hazardous chemical.

A safety data sheet (SDS) is required for any construction element/material that is a hazardous chemical. The manufacturer or importer must prepare the SDS for the hazardous chemical before first manufacturing or importing the hazardous chemical or as soon as practicable after it is manufacturing or imported, before first supplying it to a workplace.

A SDS for a hazardous chemical must include information about exposure controls and personal protection, with advice on what measures should be taken keep exposure below the relevant workplace exposure standard.

Further information on what is required in SDS is provided in the *Preparation of safety data sheets for hazardous chemicals Code of Practice*.

Note: Under WHS Regulation section 339(4), a supplier is not required to ensure a safety data sheet is provided if:

- the hazardous chemical is a consumer product, or;
- the supplier is a retailer.

However, the supplier is still required to ensure adequate information is provided (WHS Act, sections 24 -25).

See Section 3.3 for guidance on what information should be provided with construction elements or materials.

PCBUs at a workplace where hazardous chemicals are to be used also have a series of duties related to obtaining SDS and making sure SDS are readily accessible at the workplace.

Further information for PCBUs, manufacturers and importers related to SDS is provided in Section 2.2 of the *Managing risk of hazardous chemicals in the workplace Code of Practice*.

3.5 PCBU duties - what is reasonably practicable?

WHS Act section 18: In the WHS Act, reasonably practicable, in relation to a duty to ensure health and safety, means that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including:

a) the likelihood of the hazard or the risk concerned occurring

b) the degree of harm that might result from the hazard or the risk

c) what the person concerned knows, or ought reasonably to know, about:

i. the hazard or the risk

ii. ways of eliminating or minimising the risk

d) the availability and suitability of ways to eliminate or minimise the risk

e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

The standard of 'reasonably practicable' in health and safety duties applies to a PCBU. Other duty holders are required to meet different standards, for example officers must exercise 'due diligence' and workers and others at a workplace must take 'reasonable care'.

The question of what is reasonably practicable is determined objectively (that is, by what a reasonable person in the position of the PCBU would do in the circumstances) - not by reference to a PCBU's capacity to pay or other individual circumstances. A PCBU cannot expose people to a lower level of protection simply because it is in a lesser financial position than another PCBU facing the same hazard or risk in similar circumstances.

Further information on what is 'reasonably practicable' is provided in the Safe Work Australia Guide - *How to determine what is reasonably practicable to meet a health and safety duty*.

4. Consultation

4.1 Consulting with workers

WHS Act section 47(1): The PCBU must, so far as is reasonably practicable, consult with workers who carry out work for the business or undertaking who are, or are likely to be, directly affected by a matter relating to work health or safety.

WHS Act section 48(2): If the workers are represented by a health and safety representative, the consultation must involve that representative.

A PCBU is required to involve workers in the risk management process, including identifying risks and choosing the right controls.

A safe workplace is achieved when everyone involved in the work can talk about hazards and risks, and work together to find the right solutions.

Consultation with workers about RCS at the workplace involves:

- sharing information about sources of RCS exposure at the workplace
- sharing information about health risks from RCS
- giving workers a reasonable opportunity to express their views
- giving workers a reasonable opportunity to raise health and safety issues
- taking those views and issues into account
- advising workers of the outcome of the consultation in a timely way.

Where there is a risk of exposure to RCS in the workplace, the PCBU must consult with workers on the following matters related to RCS:

- identifying the tasks that might lead to RCS exposure
- making changes to tasks that generate or make RCS
- making changes to controls to protect workers from RCS
- making other changes that may affect worker health and safety, such as:
  - changing the workplace layout
  - changing the job design and location
  - changing the ventilation systems
- making sure RCS risk management is included in the SWMS (refer to Section 3.1.1) for construction
- making sure RCS risk management is included in the workplace risk management plan (refer to Section 3.2.1) for manufacturing, or in a specific RCS risk management plan.
- providing air monitoring (refer to Section 9)
- providing health monitoring (refer to Section 10).

If the workers are represented by a health and safety representative, the PCBU must involve them in the consultation.

The PCBU should also have policies and procedures in place to make it easy for workers to quickly report any health and safety issues. The PCBU should make sure workers are familiar with these policies, and understand them.

Further guidance on consultation is available in the *Work health and safety consultation, cooperation and coordination Code of Practice*.

4.2 Other duty holders

> **WHS Act section 46(1):** If more than one person has a duty in relation to the same matter each person must, so far as is reasonably practicable, consult, cooperate and coordinate activities with all other persons who have a duty in relation to the same matter.

A PCBU may share responsibility for managing health and safety with other business operators who are involved in the same work, or share the same workplace.

In these situations, duty holders must, so far as is reasonably practicable, share information with each other to find out who is doing what.

Duty holders must work together in a cooperative and coordinated way so that all risks are eliminated or minimised as far as is reasonably practicable.

For example:

- Principal contractors, builders and sub-contractors (e.g. carpenters, plumbers and electricians) on a construction site must work together to eliminate or minimise the risk of RCS exposure.
- Labour hire companies and host employers should work together to maintain a record of the tasks each worker has done that required wearing RPE. Refer to Section 10 - Health Monitoring, for more information.

Refer to Section 3.5 for more information on determining what is ‘reasonably practicable’.

5. Identifying RCS hazards

The first step to manage the risk of RCS exposure in your business is to identify the tasks that might make RCS, and the tasks that might disturb RCS so that it gets it into the air.

For each task at the workplace, the PCBU therefore should find out if the task involves:

- working with materials that contain 1 per cent or more crystalline silica; and;
- generating dust likely to contain RCS; or
- disturbing dust that contains RCS so that it gets into the air.

Once the RCS hazards have been identified, the next step is to assess the risk of exposure to workers and other persons. Refer to Section 5.3 for further information on who may be at risk of inhaling RCS generated or disturbed at the workplace.

> **Note:** Walking or driving plant on settled dust containing RCS is unlikely to present a risk to workers.
>
> Housekeeping tasks involving dry sweeping or compressed air can present a risk of exposure to RCS. Refer to Section 8 for further information on housekeeping tasks.

5.1 Materials that contain crystalline silica

Many common materials used in construction and manufacturing do contain crystalline silica.

This Code is concerned with materials that contain **1 per cent or more crystalline silica**. Materials that **do** contain this much crystalline silica include, but are not limited to:

- bricks
- concrete
- engineered stone
- natural stone (e.g. granite or sandstone)
- fibre cement sheets.

If the PCBU is unsure if the material(s) contain 1 per cent or more crystalline silica, they should check the information provided by the manufacturer, supplier, or importer (such as a technical / safety data sheet).

The information provided by the manufacturer, supplier or importer should state whether the material contains 1 per cent or more crystalline silica.

If the PCBU does not already have this information, they can try:

- getting this information from the manufacturer, supplier or importer; or
- having the material tested by a NATA (National Association of Testing Authorities) accredited facility.

If the PCBU is unable to find out whether a material does contain 1 per cent or more crystalline silica, the PCBU should go ahead with the presumption that it does contain 1 per cent or more crystalline silica.

Refer to Section 2 for further guidance on how to manage the risk of RCS exposure to the standards required under this Code.

Note: Common construction and manufacturing materials that contain **less than 1 per cent crystalline silica** include, but are not limited to:

- wood
- glass
- metals, such as iron, steel, copper and aluminium
- most plastics

If the task only involves materials that contain less than 1 per cent crystalline silica, the PCBU is not required to implement controls under this Code.

Earthmoving

Construction work that involves earthmoving, such as digging trenches or tunneling, could involve materials containing crystalline silica.

That is because common materials found under the ground contain crystalline silica, such as:

- most rocks, sands and clays
- granite
- sandstone.

If the task involves high-energy earthmoving processes (such as rock ripping), with any of the above materials, it should be considered a task that involves risk of RCS exposure.

If the PCBU is unsure if the earth involved in the task or project includes material(s) containing 1 per cent or more crystalline silica, they could get a geotechnical report, petrographic test, or bulk material analysis to confirm the materials present in the earth that will be moved, processed, or disturbed.

Any testing should be representative of the material that will be disturbed by the task.

If the PCBU is unable to find out whether the earth involved in the task or project includes material(s) containing 1 per cent or more crystalline silica, the PCBU should go ahead with the presumption that it does.

Refer to Section 2 for further guidance on how to manage the risk of RCS exposure to the standards required under this Code.

Note: If the task only involves materials that do not contain 1 per cent or more crystalline silica, the PCBU is not required to implement controls as outlined in this Code.

5.2 Tasks that generate or disturb RCS

Respirable crystalline silica (RCS) can be generated and released into the air during tasks that involve high-energy processing, such as:

- cutting
- sawing
- grinding
- drilling
- scabbling
- crushing.

> **Note:** Using unpowered manual tools for construction work or manufacturing is unlikely to expose workers to hazardous levels of RCS.
>
> For further information, see the Low Risk section of Appendix 4 - Controls table.

RCS can also be disturbed after it has settled in the workplace. Disturbance can occur by:

- using dry sweeping, compressed air or high-pressure water to clean up
- letting slurry dry out before cleaning it up
- allowing excessive dust build-up around equipment and work areas.

Section 8 provides guidance on how to clean up equipment and work areas to minimise the risk of RCS building up or being disturbed.

> **Note:** A list of common tasks in construction and manufacturing that generate or disturb RCS can be found in Appendix 4 - Controls table.

5.3 Workers and other people at risk

When identifying the tasks that might lead to a risk of RCS exposure, it is important to think about primary and secondary exposure.

- **Primary exposure** to RCS may occur to workers that are doing the task that is generating dust containing RCS, or making it airborne.
- **Secondary exposure** to RCS may occur to workers doing other tasks in or near work areas where these processes are being undertaken, or have recently been undertaken.

Workers at risk of secondary exposure can include any workers carrying out tasks near where RCS is made or generated, including:

- supervision
- maintenance
- cleaning
- general labouring
- associated trades such as electrical work.

The best way to prevent workers being at risk of secondary exposure is to choose the right controls to prevent or minimise the release of RCS into the air.

The PCBU should also follow the guidance in Section 8 to prevent the build-up of RCS in the workplace.

If RPE is required to protect workers against primary exposure, the PCBU should consider the following controls to prevent secondary exposure:

- isolation, such as exclusion zones (refer to Section 7.3)
- administrative, if isolation is not reasonably practicable (refer to Section 7.5)
- RPE, if isolation and administrative is not reasonably practice (refer to Section 7.6).

6. Choosing the right controls

WHS Regulation section 35: A duty holder, in managing risks to health and safety, must:

a) eliminate risks to health and safety, so far as is reasonably practicable

b) if it is not reasonably practicable to eliminate risks to health and safety - minimise those risks so far as is reasonably practicable.

This Code outlines two methods for managing the risk of exposure to RCS in construction and the manufacturing of construction elements using the:

- controls table in Appendix 4, to choose the right controls
- hierarchy of controls, to choose the right controls.

Section 6.1 and 6.2 provide guidance on how these two methods can prevent or minimise the risk of exposure to RCS.

Note: Refer to Section 5 for further information on whether the task is in the scope of this Code of Practice.

6.1 Using the controls table

The table included in **Appendix 4 - Controls table** lists common tasks in construction and manufacturing.

Example section of the controls table - Appendix 4:

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Walk-behind saws	▪ Use saw equipped with integrated water delivery system that continuously feeds water to the blade. ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions.	Outdoors: None Indoors or enclosed: MPF 10	Outdoors: None Indoors or enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in preceding 12 months. Refer to Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.

Each row includes:

- an equipment / task
- the engineering or work practice control methods for that task
- the respiratory protective equipment (RPE) for that task, depending on:
  - how long the shift it
  - if the task is done outdoors, or indoors / enclosed area
- the trigger for health monitoring.

This information outlines the controls that should be used for that task, in order to control the risk from RCS.

Note: See Appendix 1 (Dictionary) for a definition of indoors/ enclosed area.

Equipment / task

This box describes the equipment or task.

Engineering and work practice control methods

This box describes the controls that should be used to prevent or control the release of RCS during the task. It also provides some guidance on using those controls correctly.

Some tasks have the option of different controls. These are separated by the word OR.

Respiratory protective equipment, minimum protection factor (MPF)

This box describes when RPE should be used for the task. This depends on shift length, and where the task is done.

- The box under '≤ 4 hours /shift' outlines when RPE should be used for the task if the worker will be on that task for 4 hours or less in a day.
- The box under '> 4 hours /shift' outlines when RPE should be used for the task, if the worker will be on that task for more than 4 hours in a day.

Refer to Appendix 1 - Dictionary for definitions to help you work out if a task is 'Outdoors' or 'Indoors or enclosed'.

- If the box says 'MPF 10' or 'MPF 50' for the task performed outdoors, the worker should be wearing RPE if doing the task outdoors.
- If the box says 'MPF 10' or 'MPF 50' for the task performed indoors or enclosed, the worker should be wearing RPE if doing the task indoors or enclosed.
- If the box says None, then the worker can safely perform the task without wearing RPE.

MPF means Minimum Protection Factor. MPF is used to describe how RPE stops the wearer from breathing in dust or other substances.

Further information on RPE, including MPF ratings of common types of RPE, is provided in Section 7.6 - Respiratory protective equipment.

Health monitoring

This box describes the trigger for when health monitoring should be provided by the PCBU.

The PCBU must provide health monitoring to a worker if:

- on 30 days or more over a **12 month period**, the worker has done tasks
  - involving materials that containing crystalline silica; and
  - that make RCS, or disturb RCS; and
- according to this Code, the worker should have worn RPE for those tasks.

The box also notes that a health monitoring report may include recommendations (or 'remedial measures') related to the worker or the work being done. This may include reviewing the controls used, or reassigning the worker to do other tasks.

Refer to **Section 10 - Health Monitoring** for more information and Section 10.3 for information on recommendations from the doctor conducting health monitoring.

If the table does not state that RPE should be worn for this task, this box will not be applicable.

6.2 Using the hierarchy of controls

The PCBU will need to follow the hierarchy of controls to choose the right controls, if the task is:

- not included in Appendix 4 - Controls table; or
- included in Appendix 4 - Controls table, but the PCBU does not plan to use the controls recommended in the table for that task.

Note: Section 2.2 provides a flowchart to help you understand the steps you should take if you are not going to use the controls in Appendix 4.

In choosing these controls for the task, the PCBU must:

- ensure no person at the workplace is exposed to RCS at a level above the workplace exposure standard
- remove or reduce the risk from RCS so far as is reasonably practicable.

This includes finding out if the worker should be wearing RPE to do the task. Refer Section 7 for more information on the hierarchy of controls.

To find out if the controls chosen by the PCBU are able to reduce the risk enough, the PCBU should:

- conduct **air monitoring**; or
- use **statistically valid exposure data** to demonstrate effectiveness of controls.

Note: Statistically valid exposure data can be provided by conducting air monitoring at the workplace. Or it can be provided to the PCBU by a third party, such as the manufacturer of the control being used, who has already conducted air

monitoring to test how well the control works.

Sections 9.3 and 9.4 provide more information on what statistically valid exposure data is, in accordance with this Code.

This is to find out if the controls are effective at preventing workers from being exposed to RCS above the WES.

Refer to Section 9 for information on air monitoring at the workplace, and statistically valid exposure data. Refer to Appendix 6 for guidance on how an air monitoring report can tell you if the WES has been exceeded.

Note: There are three substances (Cristobalite, Quartz and Tridymite) classified as respirable crystalline silica (RCS) by the Workplace Exposure Standards for Airborne Contaminants.

The WES for all three forms of RCS is 0.05 milligrams per cubic metre (mg/m3) averaged over an eight-hour period.

If the chosen controls prevent a worker from being exposed to RCS at a level above the WES, use of RPE is not required under this Code.

If the chosen controls do not prevent the WES from being exceeded, a risk from RCS remains to the worker. If a risk remains, RPE must be provided to the worker and used for the task.

This way of managing the risk of exposure to RCS also includes triggers for air monitoring and health monitoring.

Health monitoring

A PCBU must make sure health monitoring is provided to a worker carrying out work for their business when there is **significant risk** from exposure to RCS.

Significant risk exists where the worker is undertaking tasks that require them to wear RPE in order to keep exposure levels to below the WES.

As such, the PCBU must provide health monitoring to a worker if:

- on 30 days or more in a **12 month period**, the worker has done tasks
  - involving materials that containing crystalline silica
  - that make RCS, or disturb RCS
- according to this Code, the worker should have worn RPE for those tasks.

Refer to Section 10 - Health Monitoring for more information.

A medical practitioner (e.g., a doctor) undertaking health monitoring is looking for symptoms of harm from RCS. This could be a result of earlier exposure to RCS, or it could mean that the worker is currently being exposed to potentially hazardous levels of RCS.

The doctor may also make recommendations for **remedial measures**, which are actions that should be undertaken to make sure the workplace is safe. These could

include reviewing the controls used, wearing more effective RPE, or reassigning the worker to do other tasks.

Refer to Section 10.3 for more information on doctor's recommendations following health monitoring.

7. Guidance for using controls

WHS Regulation section 35: A duty holder, in managing risks to health and safety, must -

a) eliminate risks to health and safety so far as is reasonably practicable; and

b) if it is not reasonably practicable to eliminate risks to health and safety – minimise those risks so far as is reasonably practicable.

WHS Regulation section 36: If it is not reasonably practicable for a duty holder to eliminate risks to health and safety, the duty holder must minimise risks, so far as is reasonably practicable, by doing one or more of the following -

a) substituting (wholly or partly) the hazard giving rise to the risk with something that gives rise to a lesser risk;

b) isolating the hazard from any person exposed to it;

c) implementing engineering controls.

If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by implementing administrative controls.

If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by ensuring the provision and use of suitable personal protective equipment.

Some controls are more effective than others. Controls can be ranked from the highest level of protection and reliability, to the lowest. This ranking is known as the *hierarchy of control*.

You must always aim to ***eliminate a hazard*** and the risk (refer to Section 7.1). If this is not reasonably practicable, the risk must be minimised by using one or more of the following **higher order controls**:

- **Substitution** – refer to Section 7.2
- **Isolation** – refer to Section 7.3
- **Engineering controls** – refer to Section 7.4

If a risk remains, it must be minimised by using **administrative controls** (refer to Section 7.5), so far as is reasonably practicable. Any remaining risk must be minimised with suitable **RPE** (refer to Section 7.6).

Administrative control measures and RPE are **lower order controls**. They rely on human behaviour and supervision. If used on their own, they are less effective in minimising risks.

Note: Refer to Section 3.5 for more information on what is ‘reasonably practicable’

Use a combination of controls

A combination of controls should always be used to manage the risk of RCS exposure. For example, a task could be controlled with:

- water suppression
- local exhaust ventilation
- RPE.

Note: The following sections provide guidance on choosing the right controls, and how to use those controls effectively in the workplace. Section 8.4 provides guidance on maintenance of plant, tools and PPE, which is important to make sure they work as designed.

7.1 Elimination

Elimination is the most effective control and must always be considered before all other control measures. For managing the risk of RCS in construction and manufacturing, this can mean:

- **Eliminating the use of materials that contain 1 per cent or more crystalline silica** – by using products that do not contain crystalline silica. Care should be taken to ensure that any new materials are safe to use and that any new hazard they introduce is also controlled.

- **Eliminate the task that makes (generates) RCS -** eliminating or minimising RCS work processes onsite are best achieved in the planning and design stages of the work, in consultation with clients, designers, suppliers and workers.

7.2 Substitution

Substitution involves replacing a hazardous process or material with one that is less hazardous. For managing the risk of RCS, this can mean:

- **Substitute for a material containing a lower proportion of crystalline silica** – by using products containing less crystalline silica.

- **Substitute the task for one which generates less airborne dust** – for example, using mechanical shears, or score and snap on fibre-cement sheeting, instead of using a circular saw.

7.3 Isolation

Isolation involves separating the workers from the hazard and work areas. Isolation reduces the number of workers exposed to RCS. Isolation should only be used in combination with engineering controls, such as water suppression or dust extraction.

This can be achieved through:

- using physical or temporary barriers to stop contaminated air from spreading, such as temporary walls or sheeting

    - barriers that do not prevent dust drift should only be used where natural ventilation is sufficient (i.e. outdoors), and dust release is controlled
- enclosing equipment that generates RCS
- using fabrication rooms—i.e. water suppression tools or on-tool extraction in a room with an extraction system
- providing workers with a separate break room or area away from any tasks that may make RCS
- conducting work outside (follow manufacturer's instructions and ensure RCS does not travel in the direction of other workers or other premises).

Exclusion zones

There may be unique occasions when there is no alternative to use exclusion zones to protect workers and other persons in the area from exposure to respirable dust.

The size of the exclusion zone should be determined by a competent person after assessing the risk to all unprotected people. The prevailing conditions should be taken into account, for example, the exclusion zone may need to be extended down-wind.

> **Note:** A direct-reading instrument can be used to inform this risk assessment. Further information on direct sampling is provided in Section 9.3.2.

Exclusion zones should be used in combination with engineering controls and RPE, especially indoors for high-dust generating tasks such as grinding.

An exclusion zone should be set up and maintained to exclude workers and other people who are not wearing RPE. Warning signs should be located so that they are clearly visible before entering the area.

Signs should warn that:

- there is a dust hazard present
- access to the area is restricted to authorised persons
- RPE should be worn in the exclusion zone, when advised by the Code or where a risk assessment has determined RPE should be worn.

Where an exclusion zone interferes with other activities at a workplace, other workers should only work within the exclusion zone after being provided with RPE.

Example: warning signs

7.4 Engineering

Engineering controls use mechanical devices or physical controls to prevent RCS from being generated or released into the air.

Examples of engineering controls for RCS include:

- water suppression (refer to Section 7.4.1)
- local exhaust ventilation (refer to Section 7.4.2)
- general ventilation (refer to Section 7.4.3)
- tunnelling ventilation (refer to Section 7.4.4).

> **Note:** When properly designed and used, a combination of water suppression and local exhaust ventilation controls can be extremely effective at minimising airborne RCS.

7.4.1 Water suppression

Water suppression means using water at the point where dust is made/generated. This can prevent the dust from being released into the air.

To effectively control dust, water or fine mist suppression needs to be supplied at the right levels for the full duration of time that the work is being done. In practice, this means supplying enough water throughout the task to remove / prevent generation of any visible airborne dust.

> **Note:** Wetting the material beforehand is an inadequate method for controlling the risk of RCS.

Water suppression for power tools, fixed plant and equipment

Water-suppressed tools are available from manufacturers and retailers in Australia.

Equipment or machinery fitted with water suppression should:

- have an appropriate ingress protection (IP) rating for use with water suppression
- have the water feed attached and an adequate number of water feeds directed at the contact point to prevent dust being released during the process
- have a consistent water flow and adequate water pressure (usually at least 0.5L/min) during operation
- have a fit-for-purpose nozzle
- be fitted with guards, plastic flaps or brush guards designed to manage the water spray or mist containing respirable crystalline silica
- for underwater suppression cutting, the area around the task should be delineated
- be maintained according to manufacturer's instructions.

In the case of retrofitting, or introducing water suppression as part of a process which uses electrical equipment, consideration needs to be given to the IP rating. Only tools and machinery which have been specifically designed for use with water attachments should be used. A thorough check of electrical equipment, including electrical cords,

should also be undertaken to ensure safety when undertaking wet cutting or other processing.

Note: Water jet cutting is also a highly effective method at suppressing airborne dust.

Note: Handheld spray bottles, sponges or garden hoses should not be used to separately apply water to power tools. These methods are inadequate to suppress dust and dangerous (due to risk of electric shock) if used with power tools that are not designed for use with water.

Figure 2: on tool water suppression (source: Hilti Australia)

Earthmoving and other heavy construction plant

Rock drills, piling rigs, concrete pulverisers, crushing and screening plants and other similar heavy plant should have integrated water dust suppression systems.

Integrated water suppression is more effective than using hand-held hoses to reduce worker exposure to RCS. It is also important to remember that no method should be taken to be 100 per cent effective on its own without the support of air monitoring data.

Water misting systems

Mist and fog dust control may be used to control airborne dust where it is not possible or practicable to stop dust at the source.

Misting and Fogging systems can be on a small scale used in enclosed spaces or large scale used in open areas. They can be used with large amounts of mist to suppress large amounts of dust near the source or a fine fog to suppress general airborne dust.

When selecting or designing a water misting system, there are two important considerations:

- The water droplet size range needs to match to the airborne dust particle size range (refer to the following figure).

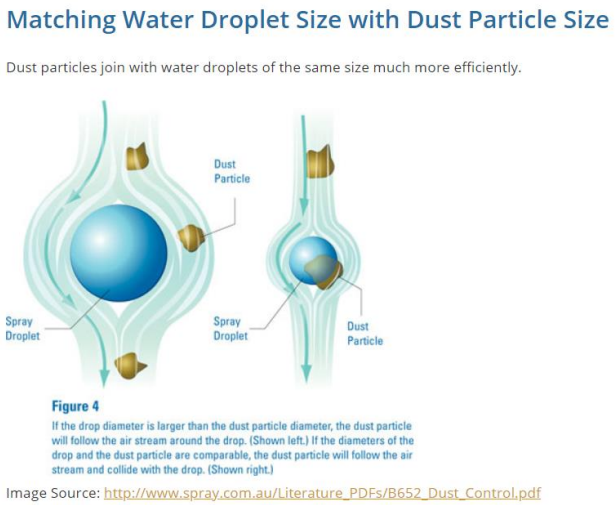


Figure 3: Matching water droplet size with dust particle size

- Water additives should be used to ensure for hydrophobic (water repellent) dust is captured by the water.

7.4.2 Local exhaust ventilation

Local exhaust ventilation (LEV) is used to capture dust (or airborne contaminants) where it is made. LEV removes the dust before it can reach the air that workers are breathing. It can be used for both wet and dry activities.

Dust contained RCS (dry or wet) is very damaging to LEV equipment. This can make the LEV equipment less effective or even break it. To prevent this, LEV equipment should be regularly inspected for damage and be properly maintained.

How effective LEV equipment is depends on:

- the task you are doing
- the work environment
- the materials you are using
- how much RCS needs to be captured.

PCBUs need to work with designers, suppliers, installers and workers to ensure the LEV will effectively control exposure.

> **Note:** Unless personal air monitoring shows that the RCS levels in the breathing zone of the worker are below the WES, RPE should always be used in combination with LEV to protect workers.
>
> Refer to Section 9 - Air monitoring for guidance on how to use air monitoring to work out if the WES has been exceeded.

The figure below provides a general indication of the effectiveness of different types of LEV used to control airborne contaminants.

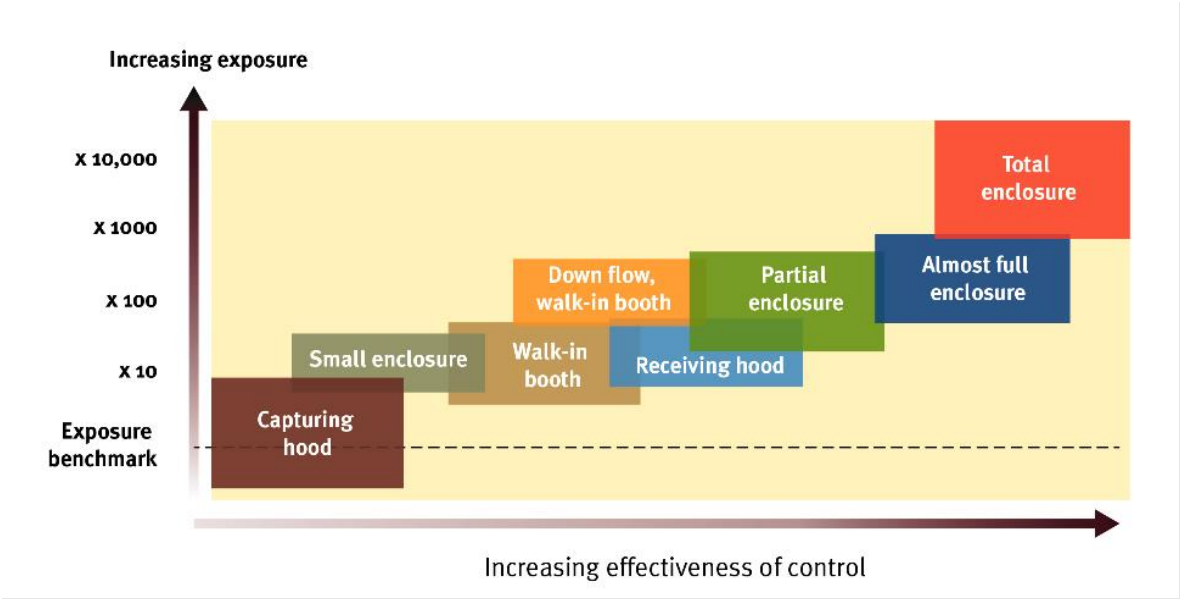


Figure 4: Effectiveness of different types of LEV to control airborne contaminants

Note: Maintenance of LEV equipment can also present a risk of exposure to RCS which must be managed by duty holders.

Refer to Section 8.4 for further information on the maintenance of tools and equipment.

On tool- dust extraction

This method removes dust as it is being produced. It is a type of LEV system that fits directly onto the tool. This system consists of several parts – the tool, capturing hood, an M or H class dust extraction unit or vacuum and tubing.

Dust extractors or vacuums for power tools should be H class where it is practicable, as these are much more effective at capturing dangerous dusts like RCS. M class vacuums are only permissible when it is not reasonably practicable to use an H class vacuum.

For all power tools (with the exception of power drills), the dust extractor or vacuum should meet the requirements of M or H class requirements of AS/NZS 60335.2.69:2017 Household and similar electrical appliances – Safety – Particular requirements for wet and dry vacuum cleaners, including power brush, for industrial and commercial use (IEC 60335.2.69 ED 5, MOD).

For power drills, the dust extractor should meet the requirements above, or use a HEPA-filtered tool mounted dust collector.

Figure 5: On tool dust extraction (Source: WorkSafe Queensland)

Figure 6: on tool dust extraction (Source: Hilti Australia)

Where the material can be lifted, placing a sacrificial backer-board or spoil-board under the material during cutting or trimming can prevent dust from being released below, thereby increasing the effectiveness of on-tool extraction. MDF or particle board would be suitable for this purpose.

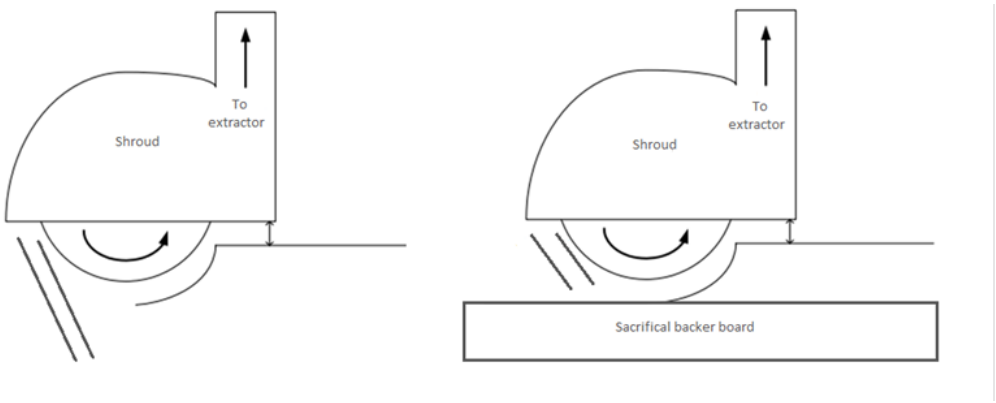


Figure 7: Use of sacrificial backer-board under material being cut to prevent dust release under material

Design and testing of ventilation systems

When using LEV to control RCS, the LEV should be designed to work well for the task. For example, capturing hoods generally work only over small distances. If you are thinking of using a capturing hood, you should think about:

- the capture distance at which a hood will work effectively
- the required capture velocity needed to capture different kinds of dusts.

Ventilation systems require regular testing to ensure correct operation, as they can:

- develop leaks
- get filter blockages
- have failing fan performance.

If the workplace uses a LEV system to control RCS, one of the two following simple devices can be used for testing both the air flow of the exhaust system and the capture velocity actually being produced with exterior hood:

- air current tubes – these tubes produce a white aerosol allowing visualisation of air flow
- anemometer – whirling vane or a hot wire anemometer to measure actual air flow rates.

The table below can be used as a guide when testing the velocity at the capture point outside an exterior or capturing hood. Minimum air velocity (ventilation rates) will vary depending on the method in which the dust is being generated. The (air movement) extraction rate has to be measured at or near to the point of dust generation.

Type of contaminant being generated	**Air speed required m/s at point of capture**	**Inlet velocity if capture point is 1 hood diameter away m/s**
Dusts from pouring operations	0.5 – 1	5 – 10
Crusher dusts	1 – 2.5	10 – 25
Grinding, blasting, high speed wheel generated dusts	2.5 – 10	25 – 100

Note: See the *Capture Velocity* section of the *Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV) - HSG258* (hse.gov.uk) for further guidance on the application of the capture velocities listed in the above table.

7.4.3 General ventilation

WHS Regulation section 40(e): A PCBU at a workplace must ensure, so far as is reasonably practicable, ventilation enables workers to carry out work without risk to health and safety.

Workplaces must have sufficient ventilation to enable workers to carry out work without risks to health and safety.

Natural ventilation for controlling RCS can help in outdoor settings and in big open buildings. However, it is only helpful if there are very small amounts of RCS are in the air. It can also depend on the weather and wind direction.

In most cases, natural ventilation is not effective enough on its own.

When indoors, fans or large air extraction systems can be used to move the air around. They should be arranged so that clean air (without RCS or dust) reaches the workers, and the contaminated air (with RCS or dust) is moved away from workers.

You also should plan the extraction or movement of contaminated air to prevent it from causing an exposure hazard to people or businesses downstream.

You should also be careful to make sure fans do not dry any wet slurry before it can be cleaned up. This would increase the risk of RCS dust becoming dry and airborne.

Using these controls to improve the general ventilation to a room or building may help reduce the amount of RCS in the air near workers, but cannot be relied upon to remove the risk. Other controls must be used to manage the risk of RCS exposure, if a risk remains.

7.4.4 Tunnelling ventilation

Effective control of exposures to RCS in the underground environment heavily relies on adequate ventilation.

In addition to meeting minimum quantities of air for people in tunnel environments, specific attention is needed on the extraction of airborne contaminants at the source.

A key source of exposure is during the maintenance of mechanical ventilation systems, and therefore engineering controls, coupled with safe systems of work and the use of personal protective equipment is typically necessary to reduce exposure to below the WES.

For more specific information, refer to the Guide for Tunnelling Work published by Safe Work Australia.

Note: The controls table does not apply to tunnelling, or construction work in a

tunnel. Refer to Section 2.2 for the steps to follow when you are not using the controls table.

7.5 Administrative

WHS Regulation section 36(4): If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by implementing administrative controls.

Administration controls are ways of working that are designed to minimise worker exposure to a hazard.

Note: Administrative controls are intended to enhance higher order control measures. Refer to Section 7 for more information on higher and lower order controls.

Work practices

Work practices can support higher order controls to be more effective or keep workers away from RCS.

The following work practices assist in reducing the amount of exposure:

- planning for routine (or daily) checks of higher order controls, such as guards and local exhaust ventilation, as well as respiratory protective equipment
- wetting the materials containing crystalline silica before the task. This can remove dust and help with water suppression.
- washing the materials containing crystalline silica after the task. This can remove any dust left behind.
- planning for good housekeeping, including regular cleaning of work areas (refer Section 8 - Cleaning up for more information)
- making sure workers wash their hands and face thoroughly before eating, drinking or leaving the workplace.

Rotating workers to reduce the time spent on tasks that make (or generate) RCS can help reduce the risks to health. However, it is not acceptable as a control on its own and should only be used to support higher order controls.

Note: Refer to Section 7 for more information on higher and lower order controls.

If the task is construction work, then a SWMS must be prepared before the work starts. See Section 3.1.1 for further information.

Safe work procedures

How workers use power tools, equipment and other machinery affects how much RCS is made or generated.

Before plant or equipment is used in the workplace, the PCBU must provide the workers and anyone else using it with the information, training, instruction or supervision needed to use the plant or equipment safely. This includes guidance on how to use the plant or equipment with the right controls to protect them from risks including RCS.

Safe work procedures should be developed that include instructions on:

- the correct use of guarding and RCS control measures
- how to operate the plant and equipment in a manner that reduces RCS exposure
- how to carry out inspections, shut-down, cleaning, repair and maintenance of both the plant and RCS controls
- emergency procedures
- the use of personal protective equipment (PPE), such as protective footwear, eye wear, respiratory protective equipment (RPE), or an apron.

7.6 Respiratory protective equipment (RPE)

WHS Regulation section 36(5): If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by ensuring the provision and use of suitable personal protective equipment.

WHS Regulation section 44(2-4): The PCBU who directs the carrying out of work must provide the personal protective equipment to workers at the workplace, unless the personal protective equipment has been provided by another person conducting a business or undertaking.

The person conducting the business or undertaking who directs the carrying out of work must ensure that personal protective equipment provided under subsection (2) is -

a) selected to minimise risk to health and safety, including by ensuring that the equipment is:
    i. suitable having regard to the nature of the work and any hazard associated with the work; and
    ii. a suitable size and fit and reasonably comfortable for the worker who is to use or wear it; and
b) maintained, repaired or replaced so that it continues to minimise risk to the worker who uses it, including by ensuring that the equipment is -
    i. clean and hygienic; and
    ii. in good working order; and
c) used or worn by the worker, so far as is reasonably practicable.

The PCBU who directs the carrying out of work must provide the worker with information, training and instruction in the -

a) proper use and wearing of personal protective equipment; and
b) the storage and maintenance of personal protective equipment.

WHS Regulation section 46(2-4): The worker must, so far as the worker is reasonably able, use or wear the equipment in accordance with any information, training or reasonable instruction by the PCBU.

The worker must not intentionally misuse or damage the equipment.

The worker must inform the PCBU of any damage to, defect in or need to clean or decontaminate any of the equipment of which the worker becomes aware

RPE are types of breathing masks that keep RCS out of the air you breathe.

Note: RPE should never be relied upon as the only control for tasks that generate RCS. Refer to Section 7 for more information on higher and lower order controls.

When should you use RPE?

If you are using the controls table in Appendix 4 to choose the right controls, you should make sure RPE is used whenever the table states that it should.

- Refer to **Section 6.1 - Using the controls table** for more information.

If you are not using the controls table in Appendix 4 to choose the right controls, you should make sure RPE is used when air monitoring[4] has shown that the levels of RCS in the breathing zone of the worker exceeds the workplace exposure standard.

- Refer to **Section 6.2 - Using the hierarchy of controls** for more information.

Note: Refer to Section 9 for information on how to organise air monitoring at the workplace.

Refer to Appendix 6 for guidance on how an air monitoring report can tell you if the WES has been exceeded.

Duties for providing and using RPE

The WHS Act and WHS Regulation includes specific duties for providing and using RPE in the workplace.

Who	Duties	Provisions
Person conducting a business or undertaking (PCBU)	Correctly select RPE, including make sure it is: – able to protect against RCS in the air – the right fit for the worker who will wear or use the RPE (see Section 7.6.1 for more information)	WHS Regulation s.37(a) s.44(3)(i) s.44(3)(ii)
	Train workers in the right way to use and wear RPE	WHS Regulation s.44(4)(a)
	Make sure the RPE is used correctly, including by supervising how it is used	WHS Regulation s.37(c)
	Make sure RPE is working correctly before each use	WHS Regulation s.44(3)(b)
	Maintain the RPE	WHS Regulation

[4] Statistical analysis carried out in accordance with 5.5.2 or 5.5.3 of EN689.

		s.37 s.44(3)(b)
	Store the RPE correctly	WHS Regulation s.44(3)(b) s.44(4)(b)
Principal contractors	Make arrangements to make sure RPE is used to the standard required of the PCBU (see above)	WHS Regulation s.314
Workers	Use or wear RPE in accordance with any information, training or reasonable instruction given by the PCBU	WHS Regulation s.46(2)
	Do not intentionally misuse or damage the RPE	WHS Regulation s.46(3)
	Let the PCBU know about: – any damage to the RPE – any defect with the RPE – any need to clean or decontaminate the RPE	WHS Regulation s.46(4)

RPE program for the workplace

WHS Regulation section 19(3)(c): A PCBU must ensure, so far as is reasonably practicable, the provision and maintenance of safe systems of work.

In order to make sure everyone is meeting the above duties, PCBU should implement an RPE program for the workplace that meets the standards of AS 1715, as a safe system of work.

An RPE program is a set of agreed policies and procedures for the use of RPE, which should include the following:

- providing and using the right RPE
- fit-testing (if relevant to the RPE used)
- a use, maintenance and repair program
- a facial hair policy for tight-fitting respirators.

Sections 7.6.1 to 7.6.3 provide guidance and outline the requirements for each of these aspects of the RPE program.

7.6.1 Choosing the right RPE

Choosing the right RPE

When choosing the RPE, you need to think about:

1) When choosing the RPE, you must make sure the RPE is suitable;

   a. Respirators should comply with Australian standard AS/NZS 1716. This number is usually displayed on the respirator or its packaging.

   b. The respirator should provide the required minimum protection factor (MPF). See the table below from AS/NZ 1715 for further information.

   c. You should consider RPE maintenance requirements, including cleaning and availability of appropriate equipment and spare parts.

Required minimum protection factor	Suitable RPE
Up to 10	• P1, P2 or P3 (see Clause 4.2.3.5) filter half facepiece—replaceable filter • P1 or P2 disposable facepiece • PAPR—P1 filter in PAPR with any head covering or facepiece
Up to 50	• P2 filter in full facepiece • PAPR-P2 filter in PAPR with any head covering or full facepiece • PAPR-P3 filter in PAPR with any head covering • Half facepiece with positive pressure demand or continuous flow air-line • Half facepiece—air-hose RPE with electric blower
Up to 100	• P3 filter in full facepiece • Full facepiece air-hose (hose mask) natural breathing type
100+	• PAPR-P3 filter in PAPR with full facepiece or head covering and blouse • Head covering air-hose with electrical blower • Head covering air-line respirator—continuous flow • Full facepiece air-line respirator—positive pressure demand or continuous flow modes • Full facepiece air-hose with electric blower

Figure 8: MPF guidance extract from AS/NZS 1715 (Source: SAI Global)

Notes on particulate filters

To protect against airborne RCS, respirators need to incorporate a particulate filter.

Particulate filters are classified and marked as P1, P2 or P3, with P3 providing the highest level of protection. P3 protection can only be achieved if the P3 filter is used with at least a full-face respirator. All three classes of filter are suitable to protect against RCS. Refer to Table 1 below for more information on the particulate filter classes and their suitability for different types of particulate.

Table 1: Particulate filter classes and suitability

	Filter type		
Particulate type	P1	P2	P3
Mechanically generated particulates (e.g. RCS)	✓	✓	✓
Thermally generated particulates (e.g. welding fume)	X	✓	✓
Highly toxic or highly irritant particulates (e.g. beryllium)	X	X	✓

Note: Particulate filters only protect against solid and liquid particles including micro-organisms. They do not protect against gases or vapours such as solvent vapour.

Note: For particulate filters rated to overseas or international standards, seek advice from the manufacturer or a competent person.

2) When choosing the RPE, you must consider the worker who will be using the RPE;

   a. Workers may have pre-existing medical conditions (for example, chronic lung diseases such as asthma) that could restrict or prevent the wearing of certain types of respirators.

   b. Comfort; face shape and size will influence the size and model of respirator appropriate for each wearer.

   c. Facial hair. This can be an issue for tight-fitting respirators (i.e., half and full-face RPE, both negative and positive pressure) because the hair can prevent it from forming a tight fit.

3) When choosing the RPE, you must consider the task the RPE will be used for;

   a. How long does the RPE need to be worn and the physical demands of the task for example, wearing unpowered RPE for more than an hour or during hard physical work may become uncomfortable and result in a person removing the respirator while still in a contaminated area.

   b. What other PPE will be worn. For example, some safety glasses may interfere with the fit of the respirator.

   c. Whether the task requires the worker to have unrestricted vision or be able to speak clearly.

4) When choosing the RPE, you must consider the work environment

   a. How hot and humid the work environment is. For example, powered respirators may be more appropriate where heat stress is a risk.

7.6.2 Fit-testing

Fit-testing is required for all tight-fitting RPE provided by the PCBU to protect against RCS.

The table below provides further guidance on types of RPE which require fit-testing.

Category	RPE types	Fit-testing required
Tight fitting RPE	All types of disposable and reusable half-face RPE, including negative pressure, positive pressure and airline/air-fed types. All types of full face RPE, including negative pressure, positive pressure and airline/air-fed types.	Yes

Loose fitting RPE	Loose-fitting hoods, helmet and visor-types (using positive pressure or air-fed supply).	No

Fit-testing detects if air leaks into the respirator through gaps in the seal between the respirator facepiece and face. It is an essential step in the RPE selection process and allows a PCBU to determine if the specific make and model of RPE is a suitable size, fit and comfort for the worker who is going to use it.

Fit-testing must be undertaken before the specific make and model of RPE can be used. Planning fit-testing should form part of the review process for producing a Safe Work Method Statement or an RCS Dust Control Plan. See Section 3.1.1 and Section 3.2.1 for more information.

There are three types of fit-testing methodologies:

Qualitative (QLFT) – Aerosol taste test (ATT) most commonly uses saccharin or Bitrex as the test agent. It is a pass/fail test that relies on the wearer's ability to taste or smell the test agent. Providing the person can taste the selected agent, if they can't taste the aerosol wearing the disposable/ filtering facepiece or a half face reusable respirator fitted with a particulate filter while undertaking the set movement activities, then an acceptable fit has been achieved. This type of test is only suitable to test respirators with a MPF of 10 (including half face disposable and reusable respirators).

Quantitative (QNFT) – Ambient aerosol condensation nuclei-counting (CNC) uses the ambient aerosols in the immediate fit-testing environment to measure the amount of aerosol inward leakage getting inside the respirator compared to the amount outside the respirator. This ratio of reduction indicates the fit factor being achieved during the fit-test.

Quantitative (QNFT) – Controlled negative pressure (CNP) method uses the principle of 'controlled negative pressure' – it creates a slight negative pressure inside of the respirator being tested (while the wearer holds their breath and remains still) and monitors the pressure in order to measure any face seal leakage.[5]

Quantitative fit-testing is the preferred way to fit-test RPE, as it doesn't depend on tasting or smelling a test agent and is suited to testing a wider range of RPE.

The following AIOH RESP-FIT guide explains the suitability of the fit-testing methodologies for various types of RPE.

[5] For further information, refer to the Australian Institute of Hygienists RESP-FIT program: https://respfit.org.au/faqs/#what-are-the-differences-between-the-methodologies

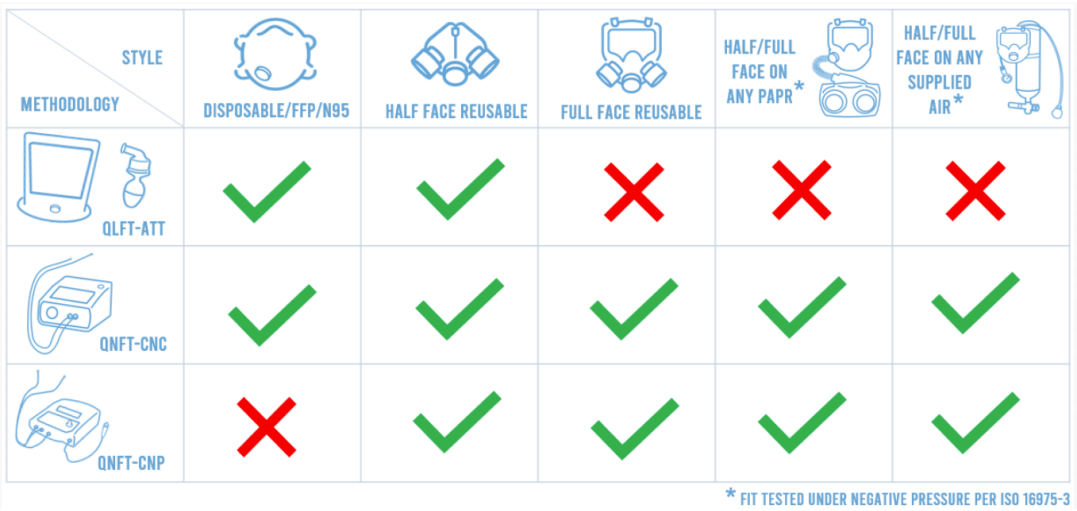


Figure 9: RESP-FIT guide for fit-testing methodology (source: https://respfit.org.au/)

Frequency of fit-testing

In addition to ensuring a tight-fitting respirator has been successfully fit-tested before it is first used, fit-testing should also occur:

- at least once per year
- whenever there is a change in the wearer's facial characteristics or features which may affect the facial seal (e.g. large weight loss or gain).
- each time a new make or model of tight-fitting respirator is issued.

Note: It is not necessary to undertake a fit-test when you are simply replacing a respirator with the exact same make and model you have already been successfully fit-tested to (this goes for both disposable and reusable respirators).

Who can conduct fit-testing?

Fit-testing can be carried out in a range of settings, including mobile testing units, specialist facilities or in-house using the appropriate equipment. You should take steps to ensure that person who carries out the fit-test is appropriately trained, qualified and experienced, and has, at a minimum, the following competencies:

- knowledge of the respirators used for the fit-test
- knowledge of the fit-test method
- ability to set up all applicable equipment and monitor its function
- ability to carry out the test and evaluate the results
- ability to identify likely causes of fit-test failure.

Note: Fit-testing can be carried out by any competent person who meets the above requirements, including but not limited to a manufacturer, supplier or service provider.

Note: Most fit-testing providers will provide a fit test card and/or certificate, which will help the PCBU to keep a record of all fit-testing undertaken.

Fit checking

Fit-checking should be carried out each time a fit-tested respirator is used. This pre-start check is to determine whether the wearer has properly positioned the respirator on their face and achieved a good seal. The respirator manufacturer will provide instructions on how to carry it out.

Note: Fit checking is not a substitute for fit-testing.

Facial hair

PCBUs should ensure workers who undergo fit-testing, or are required to wear tight-fitting respirators during work, are:

- clean-shaven; or
- have no hair between their face and the seal of the respirator face piece as it can interfere with a proper fit. This is important as respirable crystalline silica particles are smaller than facial hair (see the image below).

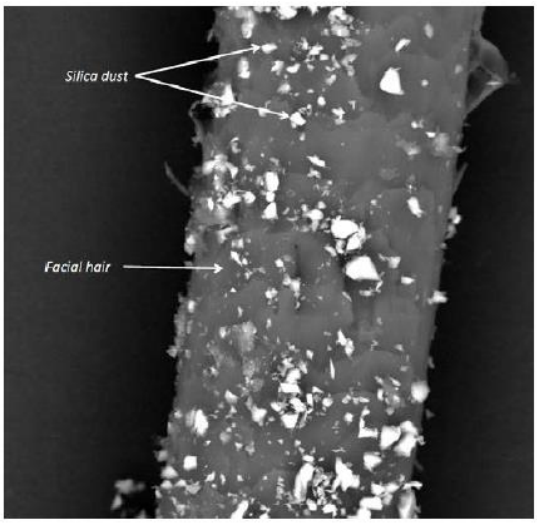


Figure 10: comparison of facial hair with RCS particle size (source: http://www.ats.org.au/wp-content/uploads/2018/12/AQWG-Part-10-of-12-RPE-Industry-Considerations-v0.07.pdf)

Half-face or full-face respirators rely on achieving a good seal with the wearer's face to properly fit. If a respirator does not fit properly, the wearer will not get the expected level of protection.

Facial hair (including beards, moustaches, sideburns and stubble) between the sealing surface of a tight-facing respirator and the wearer’s face will stop the respirator from sealing properly.

Note: AS 1715 provides further information on facial hair and fit-testing.

7.6.3 RPE training and maintenance

Training for workers who use RPE

When issuing RPE, training must be provided to ensure that workers correctly use and maintain RPE.

Initial training is best delivered when undertaking the fit-testing of RPE with workers. Training should be provided by a competent person, such as:

- a health and safety consultant
- a trained person in-house
- a representative from a RPE manufacturer or supplier
- an occupational hygienist
- the holder of a Certificate 4 in Work Health and Safety with expertise or experience in this area.

Where the training is being provided in-house, the in-house trainer should themselves have had training from a competent person (as above).

Training in the use of RPE (disposable or reusable) should cover the following topics:

- why RPE is required
- when RPE is required to be worn
- how RPE works
- the limitations of RPE
- how to correctly put on and take off RPE
- how to conduct a seal check.

Training in the use of reusable RPE should also cover:

- how to clean and maintain RPE
- when and how to replace filters and batteries (including rechargeable batteries)
- how and where to store RPE when not in use.

Ongoing training and supervision may be required to ensure that RPE is used correctly by workers. Under existing work health and safety laws, workers must take reasonable care for their own health and safety, comply with any reasonable instruction, and cooperate with any reasonable policy or procedure of the person conducting a business or undertaking relating to health or safety. This means a worker must use or wear RPE in accordance with any workplace policy and information, training or reasonable instruction given.

The PCBU should keep records of any training.

Inspection and maintenance of re-usable RPE

Under the WHS Regulation, RPE must be maintained, repaired or replaced so as to ensure that it continues to be effective.

RPE maintenance should be carried out by a competent person in accordance with the manufacturer’s instructions. A competent person is defined in the WHS Regulation as a

person who has acquired through training, qualification or experience the knowledge and skills to carry out the task.

A maintenance program should include procedures for:

- daily cleaning and inspection of RPE by the worker for wear or damage
- appropriate storage (e.g., in a dry, clean and sealed container)— each worker should be provided with a dedicated container to store their RPE. Clean, dry RPE should be stored away from dust and out of direct sunlight, and face pieces should be stored so that they are not subject to distortion
- identification and repair or replacement of any worn or defective components of the equipment including filters (including availability of replacement parts)
- regular periodic inspection, maintenance and testing of RPE in accordance with the manufacturer's instructions
- record keeping, including:
    - details of any identified issues, including the date found/reported
    - maintenance records including filter replacement and RPE maintenance schedules.

Care should be taken to ensure the RPE maintenance program takes into account the environmental conditions the RPE is being used or stored in (e.g., hot work vans) as the rubber seals may perish and require replacing more frequently.

8. Cleaning up and maintenance

Managing the risk of exposure to respirable crystalline silica (RCS) in an ongoing process. Part of this process is:

- doing regular cleaning and housekeeping
- maintaining plant and equipment.

8.1 Housekeeping

When respirable crystalline silica (RCS) is made or generated in the workplace, it can settle on floors, plant, equipment and workers' clothing.

From there, it can easily get into the air and get breathed in. That is why doing a regular clean up (or housekeeping) is an important part of managing the risk of exposure to RCS in the workplace.

> **Note:** Using effective **higher order controls** should prevent excess dust from getting into the air and settling in the workplace. See Section 7 for more information on higher order controls.
>
> If the workplace is regularly covered in dust following a task that makes or generates RCS, this should trigger a review of the control measures used for that task.
>
> Refer to Section 11 for more information of reviewing controls

Regular cleaning should be done to prevent the build-up of dust in the workplace, including:

- floors, walls and other surfaces
- scaffolds
- plant
- tools.

The PCBU should make sure that cleaning is done at least at the end of each day, so far as is reasonably practicable. Good housekeeping practices should include:

- daily, thorough cleaning of the workplace if:
  - dry dust that has settled
  - wet slurry is present, due to water suppression being used as a control (refer Section 7.4.1 for more information)
- regular cleaning of vehicle cabins
- regular cleaning of common areas and walkways
- making sure all waste products are binned in a way that stops RCS from getting into the air, such as:
  - putting the waste in a covered bin
  - keeping the waste wet
  - bagging the waste.

Cleaning methods

The PCBU should use safer cleaning methods that do not disturb RCS, so that it gets into the air. Safer cleaning methods include:

- wet sweeping
- using H or M class rated vacuum cleaner
- using low-pressure water.

Vacuum cleaners should be H class where it is practicable, as these are much more effective at capturing dangerous dusts like RCS. M class vacuums are only permissible when it is not reasonably practicable to use an H class vacuum.

The following cleaning methods are **not** recommended, as they can disturb RCS and present an exposure risk to workers:

- dry sweeping
- using compressed air or blowers
- using high-pressure water blasters.

If it is not reasonably practicable to use the safer cleaning methods, then these methods can be used if the exposure risk is managed with RPE (to protect the workers doing the cleaning) and exclusion zones (to protect other workers).

For example, high-pressure water blasters may be appropriate for cleaning earthmoving plant. However, the risk of exposure to RCS should be managed with RPE and exclusion zones.

Note: Refer to Section 3 of Appendix 4 - Controls table, for information on controls that should be used when doing cleaning tasks.

Note: The controls outlined for compressed air or blowers in Appendix 4 - Controls table are also appropriate for preventing exposure risk to workers from construction dust that does not include RCS.

Note: Refer to Section 3.4 for more information on what is ‘reasonably practicable’.

8.2 Wet slurry and recycled water

Management of wet slurry

Wet slurry is the waste made when you use water suppression to stop dust from getting into the air. It can build up where water suppressed equipment and machinery is used.

Wet slurry itself does not involve a risk of exposure to RCS. However, as is dries out, the dust can get into the air again. This means workers can get exposed to RCS.

To stop it from being left to dry out, wet slurry should be cleaned up at the end of each shift or task. Any wet slurry that is thick instead of watery should be disposed of in a way that minimises the risk of dust getting into the air (e.g. covered, kept wet, bagged).

Recycled water

When the water used in water suppression is recycled, more and more RCS can be captured in the water. This can lead to RCS being put into the air, from the mist that comes from water suppression.

Any water recycling system should incorporate a filtration or clarification system suitable for capturing and removing respirable-size particulate (dust that is small enough to be breathed in) from the water. This should minimise the risk of recycled water leading to RCS getting into the air.

8.3 Workers' clothing

Under Schedule 5A of the WHS Regulation, the principal contractor for a construction project must make sure that adequate clean water for washing the hands and face are provided in an appropriate facility, for example:

- a hose at a housing construction site
- a water container with a tap at a road construction site
- a washbasin included with a portable toilet or connected toilet at a high rise building construction site.

WHS Regulation section 41: A PCBU at a workplace must ensure, so far as is reasonably practicable, the provision of adequate facilities for workers, including toilets, drinking water, washing facilities and eating facilities.

For construction projects under $250,000 (where a principal contractor is not required), the PCBU must ensure adequate washing facilities, so far as is reasonably practicable. This should include water for washing your hands, face, and hair.

In a manufacturing workplace, the PCBU must ensure adequate washing facilities, so far as is reasonably practicable. This should include water for washing your hands, face, and hair.

Note: Additional information on requirements related to facilities at the workplace is provided in the Managing the work environment and facilities Code of Practice.

In either a manufacturing or construction workplace, H and M class vacuum cleaners are an easy and effective way to remove excess silica debris from clothes and other PPE. Using coveralls can also prevent workers' clothing from getting covered in excess dust.

Note: Compressed air is not an appropriate tool for safely removing dust from clothing and should not be used.

Note: The use of effective higher order control measures should mean that there

isn't a lot of dust settling in the workplace. If workers clothing is regularly covered in dust following a task, this should trigger a review of control measures for that task.

8.4 Maintenance of plant, tools and PPE

Plant inspection and maintenance

WHS Regulation section 213: The person with management or control of plant at a workplace must ensure that the maintenance, inspection and, if necessary, testing of the plant is carried out by a competent person.

Plant at the workplace must be routinely inspected, maintained and repaired in line with:

- the manufacturer's instructions / specifications; or, if these are not available
- the recommendations of a competent person (a person with the training, qualifications or experience to know what should be done to keep that item of plant working safely).

A system of routine checks should be put in place for all plant and equipment used or designed to control exposure to RCS in the workplace (e.g., dust extractor or vacuum). For example, checking the plant and equipment as part of a pre-start inspection or as routine maintenance.

The inspection of plant and tools at the workplace should check for:

- all tools and plant; any wear and tear, corrosion or damaged parts
- pneumatic tools and plant; any air leaks
- dust extraction equipment; any kinks, holes or leaks
- water suppression equipment; any kinks, holes or leaks
- water spray equipment; any damage to guards or flaps
- ventilation equipment, including RPE; whether filters need to be replaced.

Any failures or problems identified in the inspection should be fixed. Workers should be encouraged to report any concerns they have about plant or equipment to the PCBU.

Plant of equipment used in tasks that might make or generate RCS (such as power tools) should also be regularly inspected. Any damage should be repaired, and any worn parts (such as grinding wheels) should be replaced as needed.

PPE cleaning and maintenance

WHS Regulation section 44 (3)(b): The person conducting the business or undertaking who directs the carrying out of work must ensure that personal protective equipment provided under subsection (2) is -

b) maintained, repaired or replaced so that it continues to minimise risk to the worker who uses it, including by ensuring that the equipment is -

   i. clean and hygienic; and

   ii. in good working order

All personal protective equipment (PPE) must be maintained, repaired or replaced to make sure that it continues to be effective.

The PCBU should implement a maintenance program for PPE, which includes plans for:

- daily cleaning and inspection of PPE by the worker for wear and damage
- checking for any worn or defective parts of the PPE
- repairing or replacing any worn or defective components of equipment.

Note: Refer to Section 7.6.3 - RPE training and maintenance, for more information on how to look after and store RPE.

9. Air monitoring

Air monitoring involves testing air to find out how much of a harmful substance (such as RCS) is in the air. It is a proactive measure to determine how effective controls are, and if a worker is adequately protected.

The purpose of air monitoring for RCS is to determine the airborne concentration of RCS in the breathing zone of the worker. This will confirm if the worker is adequately protected, or if more effective controls are needed.

Note: Air monitoring does not prevent disease and it is not an alternative to using effective controls.

Air monitoring will involve measuring the level of RCS in the breathing zone of workers using a personal sampler during their usual shift activities, including routine breaks. Figure 9 shows an approximation of a worker's breathing zone.

Figure 11: Worker's breathing zone (source: Safe Work Australia 'working with silica and silica containing products' guidance material)

Note: A PCBU can use existing exposure data to determine a worker's exposure to RCS, without conducting any new air monitoring, so long as the data is statistically valid and relevant to the task, controls and conditions.

Refer to Section 9.3 below for more information on air monitoring and exposure data.

Note: Air monitoring, as required by this Code, refers to personal exposure monitoring as outlined in Section 9.3.1. For information on other types of sampling, see Section 9.3.2.

9.1 When is air monitoring required?

WHS Regulation section 50: A PCBU at a workplace must ensure that air monitoring is carried out to determine the airborne concentration of a substance or

mixture at the workplace to which an exposure standard applies if:

a) the person is not certain on reasonable grounds whether or not the airborne concentration of the substance or mixture at the workplace exceeds the relevant exposure standard; or

b) monitoring is necessary to determine whether there is a risk to health.

Air monitoring must be carried out:

- when the PCBU is not certain on reasonable grounds if the WES (see Section 1.3) is being exceeded or not;
- when air monitoring is needed to work out if there is a risk to health.

In both of these cases, the purpose is to make sure that the worker is protected from exposure to RCS at levels that exceed the WES, or if more effective controls are needed.

A number of scenarios are outlined in the table below. This table provides guidance on when a PCBU is required to make sure air monitoring is carried out.

Scenario	Air monitoring required to determine if the WES for RCS is being exceeded
Doing a task listed in Appendix 4	
Using all recommended controls for the task including RPE (if required)	No air monitoring required.
Using different controls for the task and: Having **statistically valid exposure data** for the task, that shows; – the higher order controls used minimise worker exposure to RCS below the WES or; – the higher order controls and suitably rated RPE used minimise workers' exposure to RCS below the WES	No air monitoring required.
Using different controls for the task and: Having **no statistically valid exposure data** for the task, and unable to find any.	Yes. PCBU needs to be certain on reasonable grounds that the WES is not exceeded.
Doing a task not listed in Appendix 4	
Having **statistically valid exposure data** for the task, that shows: – the higher order controls used minimise worker exposure to RCS below the WES or;	No air monitoring required.

the higher order controls and suitably rated RPE minimise workers' exposure to RCS below the WES	
Having **no statistically valid exposure data** for the task, and unable to find any.	Yes. PCBU needs to be certain on reasonable grounds that the WES is not exceeded.

Certain on reasonable grounds

A PCBU is required to conduct air monitoring for RCS if they are not certain on reasonable grounds if the WES has been exceeded.

There are a number of ways a PCBU can be certain on reasonable grounds:

1. **By using all the recommended controls** for the task as specified in Appendix 4, including RPE if required by the table.
2. When you have **statistically valid exposure data** for the task that demonstrates the **higher order controls** you are using minimise workers' exposure to RCS below the WES, without the need for RPE.
3. When you have **statistically valid exposure data** for the task that demonstrates a **combination of higher order controls and suitably rated RPE** are required to minimise workers' exposure to RCS below the WES.

If the PCBU does not use the recommended controls for the task as specified in Appendix 4, and does not have statistically valid exposure data to demonstrate the controls they are using protect workers from exposure to RCS at levels that exceed the WES, they can't be reasonably certain and must conduct air monitoring.

Note: Statistically valid exposure data can be provided by conducting air monitoring at the workplace. Or it can be provided to the PCBU by a third party, such as the manufacturer of the control being used, who has already conducted air monitoring to test how well the control works.

For the PCBU to be certain on reasonable grounds, the data should be statistically valid exposure data.

Section 9.3 provides more information on what statistically valid exposure data is, in accordance with this Code.

When is periodic monitoring required?

The need for periodic or ongoing monitoring is determined by EN 689:2018 or a method specified in the AIOH Occupational Hygiene Monitoring & Compliance Strategies.

9.2 Who can undertake air monitoring?

Air monitoring should be undertaken by a person who has acquired the knowledge and skills to carry out the task, from training, qualification or experience.

The table below provides a breakdown of air monitoring tasks and who is suitably competent to perform them.

Task	Who is qualified to do air monitoring
Plan air monitoring at the workplace (including establishing similar exposure groups and develop a sampling plan)	Certified occupational hygienist, or a recognised equivalent competency under an international certification scheme (e.g. certified industrial hygienist).
Conduct personal exposure monitoring at the workplace	• Certified occupational hygienist; or • A recognised equivalent competency under an international certification scheme (e.g. certified industrial hygienist); or • Occupational hygiene technician.
Interpreting the results of air monitoring, and drawing conclusions	Certified occupational hygienist, or a recognised equivalent competency under an international certification scheme (e.g. certified industrial hygienist).

Certified occupational hygienist competencies

A certified occupational hygienist is a full or fellow member of the Australian Institute of Occupational Hygienists (AIOH) who has been assessed by examination as demonstrating a high standard of knowledge, competence, professional judgement and problem-solving skills in the complex management of health hazards in the workplace.

The AIOH website can be used to assist with finding a certified occupational hygienist.

Occupational hygiene technician competencies

Occupational hygiene technicians are competent to conduct RCS exposure monitoring in a workplace and have completed specific training in respirable dust sampling. Some examples of training include:

- Occupational Hygiene Training Association Series 5 modules W201 Basic Principals of Occupational Hygiene, or W501 Measurement of Hazardous Substances.
- BSBWHS409 Respirable Dust Monitoring (QLD).

9.3 Air monitoring and exposure data

Air monitoring produces **exposure data**, which is a measure of how much of a harmful substance (such as RCS) is in the air. This exposure data can be used to work out how effective the controls used are.

As stated above, the PCBU is required to conduct air monitoring for RCS if they are not certain on reasonable grounds if the WES has been exceeded.

A PCBU can use existing exposure data for the specific task and controls to be reasonably certain, so long as the data came from air monitoring that meets the standards outlined in Section 9.3.1. This is to make sure the exposure data is **statistically valid**.

The statistically valid exposure data could come from a range of sources, including:

- the manufacturer of the control or tool used
- an industry association
- an occupational hygienist.

The duty is on the PCBU to be certain that the exposure data is statistically valid; and that it is relevant to the task, controls and conditions. If they are not, then they can't be certain on reasonable grounds that the controls used are effective.

If the PCBU is uncertain whether the existing exposure data is statistically valid, they should consult with a competent person (e.g. a certified occupational hygienist, or a recognised equivalent competency under an international certification scheme, e.g., certified industrial hygienist).

Note: If the worker uses the specified controls for the task from the controls table in Appendix 4, the PCBU can be reasonably certain that the worker is protected. For further information on when air monitoring is required, see Section 9.1.

9.3.1 Statistically valid exposure data - air monitoring

This section outlines how air monitoring should be conducted, with reference to sampling methods. Following these guidelines will ensure the exposure data is statistically valid and meets the requirements of this Code.

Note: This section includes technical information related to air monitoring for RCS and should be given to the person who will be undertaking the air monitoring at your workplace.

Refer to Section 9.2 for guidance on who can undertake air monitoring.

Air monitoring for RCS should include:

1. Establishment of similar exposure groups (SEGs) and the development of a personal exposure sampling plan (in accordance with EN689:2018 Workplace Exposure - Measurement Of Exposure By Inhalation To Chemical Agents - Strategy For Testing Compliance With Occupational Exposure Limit Values or another statistically valid method out lined in the AIOH Occupational Hygiene Monitoring & Compliance Strategies) that is representative of worker numbers, shifts worked, tasks performed and conditions at the workplace.

2. Undertaking **baseline** personal exposure monitoring (sampling) of workers in each relevant SEG (identified in the respirable dust sampling plan) and assessing the results using either the Preliminary or Statistical test methods described in EN689:2018 to determine if the WES is being exceeded.

3. Undertaking periodic personal exposure monitoring (sampling) as per 1 and 2 (above), at the recommended intervals in Annex I of EN689:2018, to ensure workers ongoing exposure to RCS continues to remain below the WES

All personal sampling should be undertaken in accordance with AS2985:2009 Workplace atmospheres - Method for sampling and gravimetric determination of respirable dust, with samples analysed by a NATA (National Association of Testing Authorities) (or equivalent) accredited laboratory using validated analysis methods, such as FTIR (Fourier Transform Infrared Spectroscopy) or XRD (X-ray Diffraction).

Note: Where it is not possible or practical for higher order controls to keep SEG exposures below the WES, a risk to health and safety remains.

When this occurs, the duty holder must minimise the remaining risk by ensuring the provision and use of suitable respiratory protective equipment.

9.3.2 Other types of sampling and their application

Note: This section includes technical information related to air monitoring for RCS and should be given to the person who will be undertaking the air monitoring at your workplace.

Refer to Section 9.2 for guidance on who can undertake air monitoring.

These sampling methods can be used to assist with risk assessments, monitoring and working out the size of exclusion zones. However, they are not suitable substitutes for exposure monitoring as outlined in Section 9.3.1.

Static sampling

Static (or fixed) sampling can be used to measure area-specific dust levels and identify sources and causes of dust generation, to enable dust control efforts to be focused and prioritised. Static sampling is a valuable tool for assessing the effectiveness of process controls, for example, sampling before and after the implementation of controls so the effectiveness of those controls can be verified.

Place static sampling points close to sources of dust to assess the magnitude of dust levels. Location of static sampling points should be documented in sufficient detail so that measurements can be repeated.

Note: Dust measures collected at static sampling points are not representative of actual worker exposure and cannot be used to demonstrate compliance with workplace exposure standards.

Real-time sampling

Real-time sampling uses a direct-reading device to measure dust concentrations and can be used in a variety of ways, depending on the functionality of the direct-reading device. Real-time devices can be used in conjunction with gravimetric sampling to detect changes in instantaneous dust concentrations, or even peaks in dust concentrations if the device has a logging mode. Real-time devices can also be used to give an indicative time-weighted average if collected in the breathing zone of the worker and the duration of sampling is representative of normal shift activities. It is important to note that real-time sampling cannot be used to assess compliance with workplace exposure standards. It can provide an indication of the effectiveness of control measures in place.

This means real-time sampling is not necessary for the full shift length.

The benefits of obtaining instantaneous dust concentrations, when compared to the time delay for gravimetric analysis, are that multiple measurements can be quickly made to investigate the source or cause of dust exposure, and dust controls and positioning of workers can be adjusted in real time.

There are limitations of real-time sampling devices. The most important limitation relates to the way common direct-reading instruments calculate the mass of particles being sampled. For example, a laser photometer (a common direct-reading instrument) estimates the mass based on how aerosols interact with a light source. The mass of the aerosol particles is then calculated based on the properties of the calibration aerosol and converted to a dust concentration measurement based on the volume of the air sampled.

Another form of direct-reading instrument uses the vibration mass method. Tapered element oscillating microbalance (TEOM) is commonly used technology for personal dust monitors. The mass of aerosol particles is calculated by monitoring the frequency changes in a vibrating tapered element. This mass is converted to a dust concentration measurement based on the volume of air sampled.

Note: The optical (i.e., photometer), vibration (i.e., TEOM) or beta attenuation methods do not determine mass gravimetrically in accordance with AS 2985. Measurements from these devices cannot be used to assess compliance with workplace exposure standards and are indicative only.

9.4 Keeping records of air monitoring results

All air monitoring results must be:

- kept for a period of 30 years after the record is made
- readily accessible to persons at the workplace who may be exposed to RCS
- readily accessible to the workers' health and safety representative
- made available to an inspector when requested.

When health monitoring is being provided, air monitoring results for the workplace may also be provided to the registered medical practitioner.

Note: The person who does the air monitoring and produces the results should include information in the report about if the WES has been exceeded and recommended next steps.

For further information on what should be included in air monitoring reports, see Appendix 6.

What is meant by air monitoring results?

Note: This section includes technical information related to air monitoring for RCS. This section, and Appendix 6, should be given to the person who will be undertaking the air monitoring at your workplace.

Refer to Section 9.2 for guidance on who can undertake air monitoring.

Air monitoring results should include more than just the workers' time-weighted average exposures to RCS in order to provide usable information on the effectiveness of controls, properly assess workers' exposure to RCS and to demonstrate compliance with this Code and the WHS Regulation.

10. Health monitoring

WHS Regulation section 368: A PCBU must ensure that health monitoring is provided to a worker carrying out work for the business or undertaking if -

a) the worker is carrying out ongoing work at a workplace using, handling, generating or storing hazardous chemicals (such as RCS), and there is a significant risk to the worker's health because of exposure to hazardous chemicals (such as RCS).

Note: Schedule 14 of the WHS Regulation lists the requirements for health monitoring for crystalline silica including the type of health monitoring.

Health monitoring means checking to see if a person's health has been affected by exposure to a hazardous chemical, such as respirable crystalline silica (RCS).

For workers exposed to RCS, this means checking for the early signs of serious lung diseases, including but not limited to:

- silicosis
- lung cancer.

This is important because workers can have a serious lung disease like silicosis for many years without having any symptoms.

The PCBU is responsible for providing health monitoring for their workers. The PCBU could be a sole trader, a principal contractor on a construction project, a subcontractor, a labour hire company or a manufacturing business.

In some cases there can be multiple PCBUs for a single project. The below table can be used to help PCBUs work out which workers they are required to provide health monitoring for.

Principal contractor	Subcontractor	Sole trader	Labour hire company	Manufacturing business
Workers you directly employ (i.e not subcontractors)	Workers you directly employ	Yourself	Workers you directly employ (even when working for a host employer on site)	Workers you directly employ

See Appendix 1 - Dictionary for a full definition of PCBU. Further information is provided in the 'What is a person conducting a business or undertaking?' guidance material published by Safe Work Australia.

10.1 When must health monitoring be provided?

A PCBU must make sure health monitoring is provided to a worker carrying out work for their business when there is **significant risk** from exposure to RCS.

Significant risk exists where the worker is undertaking tasks that require them to wear RPE in order to keep exposure levels to below the WES.

As such, the PCBU must provide health monitoring to a worker if:

- on 30 days or more in the previous 12 months, the worker has done tasks
  a) involving materials that containing crystalline silica; and
  b) that make RCS, or disturb RCS; and
- according to this Code, the worker should have worn RPE for those tasks.

For some jobs in construction and manufacturing, the PCBU can be reasonably certain if the worker will meet this trigger in the next 12 months.

In these instances, the PCBU must provide health monitoring to a worker because:

- on 30 days or more in the **next** 12 months, the worker will be doing tasks
  a) involving materials that containing crystalline silica; and
  b) that make RCS, or disturb RCS; and
- according to this Code, the worker should wear RPE for those tasks.

When is RPE required by this Code?

According to this Code, the worker should be wearing RPE for a task if:

- **Using the controls table in Appendix 4, to choose the right controls**; the controls table stated that RPE should be used for the task done by the worker; or
- **Using the hierarchy of controls, to choose the right controls**; statistically valid exposure data[6] finds that the higher order controls used for the task are not able to reduce worker exposure to RCS to below the Workplace Exposure Standard, and so RPE should be worn by the worker.

Note: RPE is a recommended tool for minimising exposure risk from RCS and other hazardous dusts or chemicals. A worker might wear RPE as an effective additional protection against RCS exposure, or because it is required to protect against another hazardous substance.

If a worker wears RPE for work, and they are not required to by this Code, this **does not** count towards the 30 day trigger for health monitoring

Note: The workplace exposure standard for RCS is 0.05 milligrams per cubic metre (mg/m3) (eight hour Time Weighted Average or TWA). See Section 1.3 for more information.

Note: Section 6.1 and 6.2 provide guidance on these two ways to manage the risk of exposure to RCS in construction and the manufacturing of construction elements.

10.1.1 Health monitoring - 30 day trigger

[6] Statistical analysis carried out in accordance with 5.5.2 or 5.5.3 of EN689.

The 30 day trigger for health monitoring should be worked out using the following rules:

- If the worker is required to wear RPE by this Code at any time during a day, that counts as one day of respirator use. It does not matter how long the RPE was worn for (including if the task takes 15 minutes or less).

For example, if the Code requires a worker to wear RPE while jackhammering concrete indoors for 2 hours, that time would be counted as 1 day towards the 30 days.

- If the Code requires a worker to wear RPE for two or more tasks in a day, this would still be counted as 1 day towards the 30 days.
- If the 30 days counted take place in 12 months or less, the 30 day trigger has been met. This 12-month period is not connected to a calendar year or a financial year. All that matters is that the 30 days counted take place in 12 months or less.

Record keeping

WHS Regulation section 19(3)(g): A PCBU must ensure, so far as is reasonably practicable, that the health of workers and the conditions at the workplace are monitored for the purpose of preventing illness or injury of working arising from the conduct of the business or undertaking.

WHS Regulation section 46: If more than one person has a duty in relation to the same matter under this Act, each person with the duty must, so far as is reasonably practicable, consult, cooperate and coordinate with all other persons who have a duty in relation to the same matter.

If the PCBU cannot be reasonably certain if the worker will meet the 30 day trigger in the next 12 months, the PCBU must monitor the worker and the conditions at the workplace to find out if the work they are doing meets the trigger at any time.

To conduct this monitoring, the PCBU should make sure that a written record is kept for each worker that includes:

- the name of the worker
- the name of the employer
- contact details for the employer
- each task that required RPE (according to this Code)
- on what date each task was done
- the controls used for each task.

Every time the PCBU adds a task to a worker's record, the PCBU should check the record to see if this new task means 30 tasks have been added in the previous 12 months. Once 30 tasks that require RPE use have been recorded, the health monitoring trigger has been met.

Note: A sample record of tasks for the health monitoring trigger is provided in Appendix 5.

Significant risk also exists when there is uncertainty about the levels of exposure for the worker(s). If the PCBU is not keeping a record to track a worker's use of RPE, when the worker should be wearing RPE for the work they do, according to this Code, the PCBU will be uncertain about the amount of exposure.

As a result, the PCBU must provide health monitoring if they are not tracking a worker's use of RPE and the worker has been doing tasks that require the use of RPE, according to this Code.

> **Note:** If a worker is employed by a labour hire company, the primary duty to provide health monitoring is with the labour hire company - not the host employer on site. The responsibility of the host employer is to record the tasks done by the worker for their project, and to share this written record with the labour hire company. This will help the labour hire company to know when to arrange health monitoring for the worker.

10.2 What should health monitoring involve?

As the PCBU, you must make sure that any health monitoring is done by a registered medical practitioner (e.g., a doctor) with experience of doing health monitoring.

The PCBU also must:

- give workers and new workers information about health monitoring
- consult workers on the doctor chosen to do the health monitoring
- pay all costs related to health monitoring
- provide the doctor with information about the worker, including:
  - the work that the worker is, or will be, carrying out that has triggered the requirement for health monitoring
  - if the worker has started that work—how long the worker has been carrying out that work.

Health monitoring is a process that can take place over a period of time. When tests take place can depend on the availability of the doctor and other services.

After the worker has received health monitoring, the PCBU must take all reasonable steps to get a written report from the doctor on the results.

The PCBU must:

- provide a copy of the written report to the worker
- provide a copy of the written report to any other PCBUs with a duty towards the worker to provide health monitoring for the worker as soon as reasonably practicable after obtaining the report (e.g., a labour hire company)
- provide a copy to Workplace Health and Safety Queensland (the Regulator), if:
  - the report has test results that suggest harm from exposure to RCS
  - the report has recommendations for remedial measures
- keep the reports as confidential records for at least 30 years after the report is made.

Further information on health monitoring can be found in Safe Work Australia's 'Crystalline silica health monitoring guide'.

Note: PCBUs can use the Hazardous chemical health monitoring report (Form 28) as the health monitoring report. This form provides information on how to lodge a report and can be found on the Workplace Health and Safety Queensland website.

Note: The PCBU must **not** disclose the report to anyone without the worker's written consent, unless required under the WHS Regulation (the requirements outlined above).

Health monitoring - what WHS Regulation requires it to involve

The following information on the minimum requirements for health monitoring should be given to the registered medical practitioner (e.g. doctor), so they can do the health monitoring to the required standard.

Note: Do not be concerned if you do not understand these requirements. If the doctor does have experience of health monitoring, they should understand them.

Under Schedule 14 Table 14.1 of the WHS Regulation the minimum requirements for health monitoring for crystalline silica are:

- demographic, medical and occupational history
- records of personal exposure
- standardised respiratory questionnaire;
- standardised respiratory function test (e.g. FEV1, FVC and FEV1/FVC)
- chest X-ray full size PA view.

All full size PA chest x-rays are to be taken and read consistent with ILO guidelines (i.e. classified by a B reader or a radiologist who has undertaken Royal Australian and New Zealand College of Radiologists approved training equivalent to the B Reader accreditation).

A B-reader is a radiologist who has undertaken specialised training to detect dust lung diseases such as silicosis, coal workers' pneumoconiosis, mixed dust pneumoconiosis and progressive massive fibrosis.

All lung function tests should be performed according to the Thoracic Society of Australia and New Zealand (TSANZ).

Safe Work Australia's Crystalline silica health monitoring guide provides further information on health monitoring for respirable crystalline silica, including on frequency of chest X-rays.

Other health monitoring methods including use of high-resolution CT

High-resolution computed tomography (HRCT) has been demonstrated to be more sensitive than X-rays in detecting early dust lung disease. Use of a HRCT scan of the chest (non-contrast) may be considered depending on the worker's history and levels of individual silica exposure. If the worker's role involves a very high level of silica

exposure (such as composite stone countertops) or a high level of silica exposure for over three years, then HRCT should be used as a replacement or adjunct to X-ray.

With the identification of rapidly progressive silicosis and advanced disease in high risk workers, notably those that work with composite stone, there may be a need to conduct more rigorous respiratory function testing. For example, incorporating measurement of the diffusing capacity of the lungs for carbon monoxide (DLCO). This is a more recent test that may not be available in regional and rural areas and may only be offered through specialist respiratory laboratories.

10.3 Health monitoring - Recommendations and remedial measures

The health monitoring report provided must include any recommendation from the doctor that the PCBU take remedial measures.

Remedial measures are recommendations for the PCBU based on the results that the doctor has received from the health monitoring.

These could include:

- recommending that the PCBU review the controls used at the workplace
- recommending whether the worker can continue to carry out the type of work that triggered the requirement for health monitoring.

The PCBU must review the controls used at the workplace if the doctor's report includes any remedial measures. This review of controls should include all tasks undertaken by the worker at the workplace that require the use of RPE, according to this Code. See Section 11 for more information on when to review controls, and how to review controls.

The PCBU should follow any other recommendations provided by the doctor in the health monitoring report, so far as is reasonably practicable.

10.4 Worker reluctance and health monitoring

Some workers may be reluctant to take part in health monitoring. This may be because they are anxious about the medical results. This may be because they are anxious about what it could mean for their job. It could be both of these reasons.

PCBUs should provide workers with information on:

- why health monitoring is important
  - including how finding out about the harm done by RCS early can help stop it becoming a more serious problem
- what health monitoring involves
- what support is available if the doctor finds a problem.

Supporting a worker if they have concerns can involve:

- letting them know how health monitoring will help them
- making the process of health monitoring as easy as possible for them

- reminding them that their workplace, family and community want them to be as safe and healthy as possible.

Health and safety representatives at your workplace (if there are any) may also be able to help to encourage the workers to take part.

If the conversation with a worker on health monitoring is stalled, it may help the PCBU to get in touch with WHSQ inspectors for assistance or further information. The PCBU may also consider contacting:

- the relevant union for the workers. Worker representation groups will have special skills for talking to workers about the importance of their health and safety in a supportive and empowering manner
- a doctor with experience conducting health monitoring. The medical professional will be able to explain the importance of spotting the signs of illness or disease as early as possible.

The worker may also advise the worker to speak with an employee assistance program (EAP). EAPs provide free, professional and confidential counselling services, and may be able to help address any anxiety related to the health monitoring.

It is recommended that the PCBU, health and safety representative and other parties document the steps taken to encourage a reluctant worker to take part in health monitoring.

11. Reviewing the controls

WHS Regulation section 38 (2): The duty holder must review and, as necessary, revise a control measure in the following circumstances -

a) the control measure does not control the risk it was implemented to control so far as is reasonably practicable;

   Examples -

   - the results of monitoring show that the control measure does not control the risk
   - a notifiable incident occurs because of the risk

b) before a change at the workplace that is likely to give rise to a new or different risk to health and safety that the measure may not effectively control;

c) a new relevant hazard or risk is identified;

d) the results of consultation by the duty holder under the Act or this regulation indicate that a review is necessary;

e) a health and safety representative requests the review under subsection (4).

WHS Regulation section 352: A PCBU at a workplace must ensure that any measures implemented to control risks in relation to a hazardous chemical at a workplace are reviewed and, as necessary, revised in any of the following circumstances -

a) following any change to the safety data sheet for the hazardous chemical or the register of hazardous chemicals;

b) if the person obtains a health monitoring report for a worker under division 6 that contains -

   i. test results that indicate that the worker has been exposed to the hazardous chemical and has an elevated level of metabolites in his or her body for that hazardous chemical; or

   ii. any advice that test results indicate that the worker may have contracted a disease, injury or illness as a result of carrying out the work using, handling, generating or storing the hazardous chemical that triggered the requirement for health monitoring; or

   iii. any recommendation that the PCBU take remedial measures, including whether the worker can continue to carry out the work using, handling, generating or storing the hazardous chemical that triggered the requirement for health monitoring.

c) if monitoring carried out under section 50 determines that the airborne concentration of the hazardous chemical at the workplace exceeds the relevant exposure standard;

d) at least once every 5 years.

Reviewing the controls in your workplace is an important job. It means checking to see if the controls are being used correctly and deciding if they are the right controls for the task.

The WHS Regulation including a number of triggers for when a review of controls is required. These include:

- when the control measure is not effective in controlling the risk
- before a change at the workplace that:
  - is likely to give rise to a new or different health and safety risk, and;
  - that the control measure may not effectively control
- if a new hazard or risk is identified
- if the results of consultation with workers indicate that a review is necessary, or
- if a health and safety representative requests a review.

The PCBU must also review controls:

- if a SDS or register of hazardous chemicals is changed
- if a health monitoring report includes:
  - test results that indicate the worker has been exposed to RCS;
  - any advice that the test results indicate the worker may have a disease, injury or illness as a result of the work that led to the health monitoring
  - any recommendation that the PCBU take remedial measures (See Section 10.3)
- if air monitoring indicates the airborne concentration of RCS at the workplace exceeds the WES
  - refer to Section 9 - Air monitoring, for more information
  - refer to Section 7.6 - Respiratory Protective Equipment, for more information
- at least once every five years.

Any of these triggers suggests that one or more control measures in your workplace may not be effective at controlling the risk of exposure to RCS.

Note: Controls should be reviewed regularly to make sure they work as planned. Do not wait until something goes wrong.

11.1 How to review controls

Reviewing the controls is all about checking to see if the controls are being used correctly and deciding if they are the right controls for the task.

To review controls, the PCBU should try to answer the following questions:

- Have you identified all possible sources of RCS in the workplace?
- Have the controls being used made the work safer?
- Are the controls in good working order? Are the controls broken in any way?
- Are workers using the controls correctly?
- Are safety procedures being followed correctly?
- Are workers using the RPE being provided for the work tasks?
- Is any further training, information or supervision needed to make sure controls are used correctly?
- Have the controls introduced any new hazards?
- Have workers raised any health and safety concerns? Are they reporting any problems in the workplace?

When considering these questions, the PCBU must consult with workers and their health and safety representative (if they have one).

> **Note:** Refer to Section 4 for more information on consulting with workers, health and safety representatives, and other PCBUs.

If the review of controls finds that there are problems in the workplace, the PCBU should make changes to fix those problems. That could include choosing different controls or deciding if the task could be done differently.

> **Note:** Refer to Section 6.2, and Section 7, for further information on choosing the right controls.

Using different controls following the review

If the PCBU chooses a different set of controls for a task, the PCBU will need to meet the same requirements to be reasonably certain that the controls they are using protect workers from exposure to RCS over the WES.

This means having statistically valid exposure data that demonstrates the controls used for the task are effective at reducing exposure levels below the WES.

> **Note:** Refer to Section 9 for information on what statistically valid exposure data is, and why it matters.

11.2 Monitoring controls and the workplace

> **WHS Regulation section 37:** A duty holder who implements a control measure to eliminate or minimise risks to health and safety must ensure that the control measure is, and is maintained so that it remains, effective, including by ensuring that the control measure is and remains -
>
> a) fit for purpose; and
>
> b) suitable for the nature and duration of the work; and
>
> c) installed, set up and used correctly.

Monitoring control measures should also include regular checks of equipment and work plans. This helps to make sure the controls are still doing a good job of protecting workers and other people at the workplace.

For example, pre-start up checks should be done to make sure:

- machine and water mist guards are fitted correctly and working effectively
- local exhaust ventilation is fitted correctly and working effectively
- local exhaust ventilation filters are clean and replaced, according to the manufacturer's instructions
- mobile plant cabins are clean, with air conditioning and door seals in good condition
- any water supply used for water suppression controls has enough water for the job

- RPE is in good condition and fit checked.

> **Note:** For more information on maintaining control measures, including plant, tools and RPE, refer to Section 7 - Choosing the right controls and Section 8.4 - Maintenance of plant, tools and PPE.

The workplace should also be regularly checked for signs of visible dust on work surfaces or clothing. This may suggest that some controls are not working as well as they should be.

12. Information and training

WHS Act section 19(3)(f): A PCBU must ensure, so far as is reasonably practicable, the provision of any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking.

WHS Regulation section 39 (2-3): A PCBU must ensure that information, training and instruction provided to a worker is suitable and adequate having regard to -

a) the nature of the work carried out by the worker; and

b) the nature of the risks associated with the work at the time of the information, training and instruction; and

c) the control measures implemented.

Providing information and training is an important tool for protecting workers and making the workplace safer.

The PCBU must provide all workers that are involved in tasks that make or disturb RCS with the information, training and or supervision needed to do the job safely. The training provided should cover the following:

- the risks from RCS (including signs and symptoms of silicosis)
- the nature of the task (including how RCS could be generated or disturbed)
- what controls to use, and how to use them effectively
- how and when RPE should be worn (including fit-testing)
- how to look after, store and maintain any controls equipment (including RPE)
- housekeeping and cleaning procedures
- the details of the relevant SWMS or RCS Dust Control Plan
    - refer to Section 3.1.1 for more information on the SWMS in construction work
    - refer to Section 3.2.1 for more information on the RCS Dust Control Plan in manufacturing
- the requirements for health monitoring (including the purpose of health monitoring, how it benefits workers, what is involved, and what support is available if the doctor finds a problem)
    - refer to Section 10 - Health Monitoring, for more information.

Note: Guidance on general construction induction training and licensing in construction, can be found on the Workplace Health and Safety Queensland website.

The PCBU must also consider who else at the workplace may be exposed to RCS (e.g., office staff), and what training and information they should be provided with on the risks from RCS and the controls being used.

The PCBU should ensure the training is delivered by a suitably qualified competent person with relevant subject matter expertise and training experience. Example of competent persons may include, but not limited to:

- a health and safety consultant
- a trained person in-house
- a representative from an RPE manufacturer or supplier (for training in RPE use)
- an occupational hygienist
- the holder of a health, safety and hygiene qualification.

Information, training and supervision must be provided in a way that is easy for the person receiving it to understand. Records of training provided to workers should be kept, including a record of who was trained, when they were trained, and what information was included.

13. Other hazards in construction and manufacturing

The PCBU should also consider their legal duties to safety manage other hazards and risks in their industry.

Codes of practice

The following codes of practice provide practical guidance on managing risks in construction work and the manufacturing of construction elements:

- Abrasive blasting Code of Practice.
- Concrete pumping Code of Practice.
- Confined spaces Code of Practice.
- Construction and operation of solar farms Code of Practice
- Demolition work Code of Practice.
- Excavation work Code of Practice.
- Formwork Code of Practice.
- Foundry Code of Practice
- Hazardous manual tasks Code of Practice.
- Mobile crane Code of Practice.
- Managing noise and preventing hearing loss at work Code of Practice.
- Managing respirable crystalline silica dust exposure in the stone benchtop industry Code of Practice
- Managing respirable dust hazards in coal-fired power stations Code of Practice.
- Rural Plant Code of Practice.
- Scaffolding Code of Practice.
- Managing the risk of falls at workplaces Code of Practice.
- Steel construction Code of Practice.
- Tilt-up and pre-cast construction Code of Practice.
- Tower crane Code of Practice.
- Traffic management for construction or maintenance work Code of Practice.
- Welding processes Code of Practice.

Workplace Health and Safety Queensland has further information on managing hazards and risks associated with:

- concrete pumping
- confined spaces
- cranes
- demolition work
- excavations
- scaffolding
- tunnelling
- work at heights

Appendix 1. Dictionary

Air monitoring: the process of collecting air samples to measure airborne contaminants to monitor workers' exposure. The Safe Work Australia publication Workplace Exposure Standards for Airborne Contaminants provides best practice guidance on air monitoring, for example:

- Where monitoring of airborne contaminants is done to estimate a person's exposure, the monitoring must be carried out in the breathing zone of the person.
- Breathing zone means a hemisphere of 300 mm radius extending in front of a person's face and measured from the midpoint of an imaginary line joining the ears.

Australian Standard: a standard, rule, code or specification of the Standards Association of Australia.

Crystalline silica: the crystalline form of the abundant naturally occurring mineral silica of silicon dioxide (SiO2), also known as 'free silica'. The main forms of crystalline silica are cristobalite, quartz, and tridymite. It is present in almost all types of rocks, sand, clays, shales and gravel and in construction materials such as concrete, tiles and bricks.

Competent person: A competent person is a person who has the skills, qualifications, competence and experience to do the task. See Section 9.2 for more information on who is a competent person to conduct air monitoring. See Section 10.2 for more information on who is a competent person to undertake health monitoring.

Due diligence: when used to refer to the duties of an officer, due diligence includes taking reasonable steps to:

- acquire and keep up-to-date knowledge of work health and safety matters
- gain an understanding of the nature of the operations of the business or undertaking of the PCBU and generally of the hazards and risks associated with those operations
- ensure that the PCBU has available for use, and uses, appropriate resources and processes to eliminate or minimise risks to health and safety from work carried out as part of the conduct of the business or undertaking
- ensure that the PCBU has appropriate processes for receiving and considering information regarding incidents, hazards and risks and responding in a timely way to that information
- ensure that the PCBU has, and implements, processes for complying with any duty or obligation of the person conducting the business or undertaking under this WHS Act
- verify the provision and use of the resources and processes mentioned above.

Enclosed cabin: For the purpose of complying with the controls outlined in Appendix 4, fully enclosed operator cabins, such as those found on earthmoving plant have been shown to effectively control exposure to RCS when fitted with properly designed and maintained HEPA air filtration.

Relevant isolation controls include:

- enclosed cabins with windows closed at all times

- ensuring cabins remain at positive pressure
- fitting high efficiency air filtering systems (e.g. HEPA filters) to the intake and cabin recirculation air intake of front end loaders, excavators and other machinery
- keeping personnel vehicles dust sealed and pressurised.

Geosynthetics: synthetic materials used to provide separation, filtration, reinforcement, stabilization or drainage, and to solve other construction and civil engineering problems. Key categories include: geotextiles, geogrids, geonets, geomembranes, geosynthetic clay liners, geocells and geocomposites.

Hazardous chemical: Respirable crystalline silica is classified as a hazardous chemical under the WHS Regulation.

More generally, a hazardous chemical is any substance, mixture or article that satisfies the criteria of one or more hazard classes in the *Globally Harmonized System of Classification and Labelling of Chemicals* (GHS), as modified by Schedule 6 of the WHS Regulation. However, some hazard classes and categories of the GHS are excluded by the WHS Regulation.

Refer to the *Managing risks of hazardous chemicals in the workplace Code of Practice* for information.

Indoors/ enclosed area: This term refers to any areas where, without the assistance of forced ventilation, the dispersal of airborne dust can be impeded and concentrations can build up. For example, a work area with only a roof that does not affect the dispersal of dust would not be considered enclosed; however, an open-top structure with three walls and limited air movement could be considered enclosed. Parking garages, pits, trenches, and empty swimming pools may qualify as enclosed areas. 'Outdoors' would be considered any work space not covered by the definition of indoors/ enclosed.

Officer: A person who makes, or participates in making, decisions that affect the whole, or a substantial part, of the business. See Section 9 of the *Corporations Act 2001* (Commonwealth) for further information.

Other persons at the workplace: Any person present at the workplace that is not the PCBU, principal contractor, an officer or a worker.

PCBU: A person conducting a business or undertaking alone or with others, whether or not for profit or gain. A PCBU can be a sole trader (e.g. a self-employed person), a partnership, company, unincorporated association or government department of public authority (including a local government). For further information, see Section 5 of the *Work Health and Safety Act 2011*.

Principal contractor: A PCBU that commissions a construction project. A construction project has only one principal contractor at any specific time.

Reasonably practicable: in relation to a duty to ensure health and safety, means that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including:

- the likelihood of the hazard or the risk concerned occurring
- the degree of harm that might result from the hazard or the risk
- what the person concerned knows, or ought reasonably to know, about:

- the hazard or the risk
- ways of eliminating or minimising the risk
- the availability and suitability of ways to eliminate or minimise the risk
- after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating the risk, including whether the cost is grossly disproportionate to the risk.

Respirable crystalline silica (RCS): crystalline silica particles which are small enough to penetrate deep into the lung (<10 µm). These particles are too small to be seen under normal lighting and the small particle size allows it to stay airborne for long periods of time.

Respirable dust: any small solid particles which are small enough to penetrate deep into the lung (<10 µm). Respirable dust is further defined in AS 2985.

Slurry: a semi-liquid mixture, typically of fine particles of dust suspended in water.

Workplace exposure standard (WES) – There are three substances (Cristobalite, Quartz and Tridymite) classified as respirable crystalline silica by the Workplace Exposure Standards for Airborne Contaminants. The WES for all three is currently 0.05 milligrams per cubic metre (mg/m^3) Time Weighted Average (TWA).

Worker: a worker is a person who carries out work in any capacity for a PCBU, including:

- an employee
- a contractor or subcontractor
- an employee of a contractor or subcontractor
- an employee of a labour hire company who has been assigned to work in the person's business or undertaking
- an outworker
- an apprentice or trainee
- a student gaining work experience
- a volunteer
- a person of a prescribed class.

The PCBU is also a worker if the person is an individual who carries out work in that business or undertaking.

Appendix 2. Safe work method statement example

Note: Work must be performed in accordance with this safe work method statement (SWMS). This SWMS must be kept and be available for inspection until the high risk construction work to which this SWMS relates is completed. If the SWMS is revised, every version should be kept. If a notifiable incident occurs in relation to the high risk construction work in this SWMS, the SWMS must be kept for at least two years from the date of the notifiable incident.

Note: Any construction work that includes a risk of exposure to respirable crystalline silica is high risk construction work, according to section 291(l) of the WHS Regulation. That is because it is *'work in an area that may have a contaminated or flammable atmosphere'*.

Person conducting a business or undertaking (PCBU):	**[PCBU Name, contact details]**	Principal Contractor (PC)	**[Name, contact details]**
Works manager::	[Name, contact phone]	**Date SWMS provided to PC:**	Click here to enter a date.
Work activity:	[Job description]	**Workplace location:**	Click here to enter text.

High risk construction work:

☐ Risk of a person falling more than 2 metres (note: in some jurisdictions this is 3 metres)

☐ Work on a telecommunication tower

☐ Likely to involve disturbing asbestos

☐ Work in or near a confined space

☐ Use of explosives

☐ Work on or near chemical, fuel or refrigerant lines

☐ Work in an area that may have a contaminated or flammable atmosphere

☐ Demolition of load-bearing structure

☐ Temporary load-bearing support for structural alterations or repairs

☐ Work in or near a shaft or trench deeper than 1.5 m or a tunnel

☐ Work on or near pressurised gas mains or piping

☐ Work on or near energised electrical installations or services

☐ Tilt-up or precast concrete elements

☐ Work on, in or adjacent to a road, railway, shipping lane or other traffic corridor in use by traffic other than pedestrians

☐ Work in an area with movement of powered mobile plant

☐ Work in areas with artificial extremes of temperature

High risk construction work:			
☐ Work in or near water or other liquid that involves a risk of drowning		☐ Diving work	

Person responsible for ensuring compliance with SWMS:	Click here to enter text.	Date SWMS received:	Click here to enter a date.
What measures are in place to ensure compliance with the SWMS?	Click here to enter text.		
Person responsible for reviewing SWMS control measures:	Click here to enter text.	**Date SWMS received by reviewer:**	Click here to enter a date.
How will the SWMS control measures be reviewed?	Click here to enter text.		
Review date:	Click here to enter a date.	**Reviewer's signature:**	

What are the tasks involved?	What are the hazards and risks?	What are the control measures?
List the work tasks in a logical order	Identify the hazards and risks that may cause harm to workers or the public	Describe what will be done to control the risk. What will you do to make the activity as safe as possible?
Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.

Name of worker(s)	Worker signature(s)
Click here to enter text.	

Name of worker(s)	Worker signature(s)
Click here to enter text.	
Date SWMS received by workers	Click here to enter a date.

Appendix 3. RCS dust control plan example

Respirable crystalline silica dust control plan

This template will help your business to document the controls used to manage the risks of exposure to respirable crystalline silica dust (wet or dry) when undertaking construction work or the manufacture of construction elements. You will need to add details regarding the safe systems of work and practices specific to your operations.

This respirable crystalline silica dust control plan was prepared on [__/__/__] and will be reviewed on [__/__/__].

Business details

Name	
Address	
Contact information (names and phone numbers)	

Details of relevant stone products being used

Product	**Silica content** (sourced from SDS or technical guide)	**SDS reference details**
Example Product 1 [name]	*Example* 70 – 90 %	

Controlling the risk of exposure to respirable crystalline silica

Place	**Task**	**Control methods**	**Respiratory protection**	**Work practices**	**How controls are integrated into daily activities**
Example only Outdoors	*Example only* Use of brick saw	*Example only*	*Example only*	*Example only* Ensure:	*Example only*

		integrated water delivery system that feeds water to the blade	• Not required (per controls table)	• water supply to the saw is turned on and operational before starting the saw • water is flowing to the cutting area prior to blade making contact with the brick • spray guards are in place before commencing work • regular clean down of saw table and surrounding areas	Tool box talks, pre-start checks and daily cleaning of work areas. E.g. daily checks: • water supply & flow • safety and spray guards are in place • Equipment (including guards) have no visible damage, no visible build up of residue, no blockages • Work area is kept clean & slurry managed to prevent drying out

Appendix 4. Controls table

Note: The controls table does not apply to tunnelling, or construction work in a tunnel. Section 2.2 outlines the steps to follow when you are not using the controls table.

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
1 – Power tools				
Stationary masonry saws (e.g., tile saws, brick saws)	▪ Use saw equipped with integrated water delivery system that continuously feeds water to the blade; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions.	N/A	N/A	N/A
	or;			
	▪ Use a saw with either: ○ an integrated HEPA-filtered dust collection system which incorporates a filter cleaning mechanism, or ○ use a saw with a commercially available dust collection system where the dust collector must provide the air flow recommended by the tool manufacturer, or greater, and be rated to either M or H-Class in accordance with AS/NZS 60335.2.69.	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Handheld power saws (any blade diameter), includes quick cut saws, concrete chasing.	▪ Use saw equipped with integrated water delivery system that continuously feeds water to the blade; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions.	Outdoor: none Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
	or;			
	▪ Use saw equipped with commercially available dust collection system; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and be rated to either M or H-Class in accordance with AS/NZS 60335.2.69.	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
Handheld power saws for cutting fibre-cement board (with blade diameter of 200mm/ 8 inches or less)	▪ Use saw equipped with commercially available dust collection system; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and be rated to either M or H-Class in accordance with AS/NZS 60335.2.69.	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Walk-behind saws	▪ Use saw equipped with integrated water delivery system that continuously feeds water to the blade; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions.	Outdoor: None Indoor/ enclosed: MPF 10	Outdoor: None Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
Drivable saws	▪ Use saw equipped with integrated water delivery system that continuously feeds water to the blade; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions	Outdoor: None Indoor/ enclosed: MPF 10	Outdoor: None Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
Core saws or drills (including rig-mounted and handheld core drilling).	▪ Use tool equipped with integrated water delivery system that supplies water to cutting surface; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions.	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Handheld and stand-mounted drills (including impact and rotary hammer drills)	▪ Use drill equipped with commercially available shroud or cowling with dust collection system; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have either: o a tool-mounted HEPA-filtered dust collector, or o an on-tool capture hood connected to a dust extractor/vacuum rated to either M or H-Class in accordance with AS/NZS 60335.2.69 ▪ Use a vacuum rated to either M or H-Class in accordance with AS/NZS 60335.2.69 when cleaning holes.	N/A	N/A	N/A
Dowel drilling rigs for concrete	▪ Use drill equipped with commercially available shroud or cowling with dust collection system; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and be either: o a tool-mounted HEPA-filtered dust collector, or o a system incorporating on-tool capture hood connected to a dust extractor/vacuum rated to either M or H-Class in accordance with AS/NZS 60335.2.69. ▪ Use a vacuum rated to either M or H-Class in accordance with AS/NZS 60335.2.69 when cleaning holes.	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
Vehicle-mounted drilling rigs for rock and concrete	▪ Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
	or;			
	▪ Operate from within an enclosed cab and use water for dust suppression on drill bit	N/A	N/A	N/A
Jackhammers and handheld powered chipping tools (i.e., removing mortar/concrete that has leaked from undersides of slabs and concrete beams/columns)	▪ Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	Outdoor: None Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
	or;			
	▪ Use tool equipped with commercially available shroud and dust collection system; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and be rated to either M or H-Class in accordance with AS/NZS 60335.2.69.	Outdoor: None Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Handheld grinders for mortar removal (i.e., tuckpointing or removing mortar/ concrete that has leaked from undersides of slabs)	▪ Use grinder equipped with commercially available shroud and dust collection system; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Dust collector must: o provide an air flow of ≥ 25 cubic feet per minute (cfm) per inch/ ~700 litres per 25mm of wheel diameter, o be rated to either M or H-Class in accordance with AS/NZS 60335.2.69, and o have a cyclonic pre-separator or filter-cleaning mechanism.	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	Outdoor: MPF 50 Indoor/ enclosed: MPF 50	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
Handheld grinders for uses other than mortar removal (e.g. concrete grinding, cutting of materials, chasing, pile trimming) **Note:** Additional controls under consideration, such the use of capture hoods, connected to a M/H class extractor.	For tasks performed outdoors only: ▪ use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. ▪ operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions.	N/A	N/A	N/A
	or;			
	▪ Use grinder equipped with commercially available shroud and dust collection system; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Dust collector must: o provide an air flow of ≥ 25 cubic feet per minute (cfm) per inch/ ~700 litres per 25mm of wheel diameter, o be rated to either M or H-Class in accordance with AS/NZS 60335.2.69, and o have a cyclonic pre-separator or filter-cleaning mechanism.	Outdoor: None Indoor/ enclosed: None	Outdoor: None Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Walk-behind milling machines and floor grinders (includes concrete polishing)	▪ Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface; and ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	N/A	N/A	N/A
	or;			
	▪ Use machine equipped with dust collection system. ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. ▪ Dust collector must: o provide the air flow recommended by the manufacturer, or greater, and o be rated to either M or H-Class in accordance with AS/NZS 60335.2.69. When used indoors or in an enclosed area, use a either M or H-Class in accordance with AS/NZS 60335.2.69 to remove loose dust in between passes.	N/A	N/A	N/A
2 - Mobile plant				
Small drivable milling machines (less than half-lane)	▪ Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant; and ▪ Operate and maintain machine to minimise dust emissions.	N/A	N/A	N/A
Large drivable milling machines (half-lane and larger)	**For cuts of any depth on asphalt only**: ▪ use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust; and ▪ operate and maintain machine to minimise dust emissions.	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
	For cuts of four inches in depth or less on any substrate: ▪ use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust; and ▪ operate and maintain machine to minimise dust emissions.	N/A	N/A	
	or;			
	▪ use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant; and ▪ operate and maintain machine to minimise dust emissions.	N/A	N/A	N/A
Crushing machines	▪ Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g. hoppers, conveyers, sieves/sizing or vibrating components, and discharge points); and ▪ Operate and maintain machine in accordance with manufacturer's instructions to minimise dust emissions; and ▪ Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station.	N/A	N/A	N/A
Shot blasting / sand blasting	Refer to the Abrasive blasting Code of Practice for guidance on selecting appropriate controls for this task			
Heavy equipment and utility vehicles for tasks such as grading and excavating but not	▪ Apply water and/or dust suppressants as necessary to minimize dust emissions	N/A	N/A	N/A
	or;			

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
including: Demolishing, abrading, or fracturing silica-containing materials (e.g. loading of demolished materials onto trucks)	▪ Operate equipment from within an enclosed cabin. o Fully enclosed operator cabins, such as those found on earthmoving plant have been shown to effectively control exposure to RCS when fitted with properly designed and maintained HEPA air filtration. ▪ Relevant isolation controls include: o enclosed cabins with windows closed at all times o ensuring cabins remain at positive pressure. ▪ Fitting high efficiency air filtering systems (e.g. HEPA filters) to the intake and cabin recirculation air intake of front end loaders, excavators and other machinery.	N/A	N/A	N/A
	▪ When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimise dust emissions	N/A	N/A	N/A
Heavy equipment and utility vehicles used to cut, abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping, use of hydraulic rams) or used during demolition activities involving silica-containing materials (e.g., breaking down	▪ Operate equipment from within an enclosed cabin. o Fully enclosed operator cabins, such as those found on earthmoving plant have been shown to effectively control exposure to RCS when fitted with properly designed and maintained HEPA air filtration. ▪ Relevant isolation controls include: o enclosed cabins with windows closed at all times o ensuring cabins remain at positive pressure. ▪ Fitting high efficiency air filtering systems (e.g. HEPA filters) to the intake and cabin recirculation air intake of front end loaders, excavators and other machinery.	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
concrete slabs, beams and walls)	▪ When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimise dust emissions	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
3 – Housekeeping and clean-up activities				
Vacuuming	▪ As a minimum, use a H or M class vacuum cleaner (RPE is not necessary for vacuuming).	N/A	N/A	N/A
Dry sweeping	▪ Isolate the work area; and ▪ Substitute with wet sweeping, vacuuming or other wet methods where practicable.	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
Wet sweeping	▪ Sufficient water should be added to prevent elevated levels of airborne dust.	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Using compressed air or blowers	▪ Isolate the work area; and ▪ Should be substituted with wet methods where practicable.	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	Outdoor: MPF 10 Indoor/ enclosed: MPF 10	PCBU to provide health monitoring, if worker has undertaken tasks requiring RPE for 30+ days in 12 months. See Section 10.3 for guidance on what the recommendations from a doctor might be following health monitoring.
Clean-up of dried slurry	▪ Wet cleaning methods. or ▪ Use a H or M class vacuum cleaner.	N/A	N/A	N/A
Operation of walk behind or ride on sweeping equipment.	▪ Use HEPA-filtered equipment, or that incorporates water scrubbing / wet cleaning methods.	N/A	N/A	N/A
4 – Other tasks with low risk				
Use of manual (i.e., non-powered) tools to score, snap or split	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations.	N/A	N/A	N/A
Use of powered shears	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations.	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Handling of dry bags	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations.	N/A	N/A	N/A
Mixing of dry materials for less than 15 minutes per day (i.e. mixing small amounts of mortar or concrete)	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations. ▪ Risk management should consider any other hazardous chemicals that may be in the dry materials.	N/A	N/A	N/A
Removing concrete formwork	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations.	N/A	N/A	N/A
Hand sanding and finishing of concrete	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations.	N/A	N/A	N/A
Shot fired fixing into concrete	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations.	N/A	N/A	N/A

Equipment / task	Engineering and work practice control methods	Respiratory protective equipment, minimum protection factor (MPF)		Health monitoring
		≤ 4 hours /shift	> 4 hours /shift	
Working with silica-containing products while wet (e.g., finishing and hand wiping block walls to remove excess wet mortar, pouring concrete, and grouting floor and wall tile)	▪ This activity is likely to generate exposure well below the WES when undertaken in isolation from activities that generate significant exposures to silica. ▪ Manage risks so far as reasonably practicable, this includes following the manufacturer's recommendations.	N/A	N/A	N/A

Appendix 5. Record of tasks for health monitoring trigger example

Date: Record of the date on which the task was done as day / month / year. If the task took multiple days, record each day as a separate entry.
Task: Briefly name the task and conditions. Conditions include a) if the task took more or less than four hours, and b) if the task was outdoors or enclosed.
Controls used: Briefly describe the isolation, engineering and work practice control measures used to prevent the release of silica dust, including but not limited to: • Isolation; can include fabrication rooms, enclosed equipment and exclusion zones. • Engineering; can include water suppression, local exhaust ventilation, general ventilation or tunnelling ventilation. • Work practice; can include task rotation, safe work procedures and warning signs. The respiratory protective equipment (RPE) used should be identified in the RPE - MPF column.
RPE - MPF: State the minimum protection factor (MPF) of the RPE used. See Section 7.6 of the Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements Code of Practice for more information on MPF.

This record is used to determine when a worker meets the 30 day trigger for health monitoring in the Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements Code of Practice (the Code).

Every time a worker does a task that requires the use of RPE, according to the Code, the date, task, controls and RPE should be recorded in the below table. If tasks are recorded on 30 days in a 12 month period, then the health monitoring trigger has been met. At this point, the PCBU must provide health monitoring for the worker.

Further information on duties and requirements is provided in the Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements Code of Practice.

Worker name:

Employer name: Employer contact phone number:

Date	Task and conditions	Controls used	RPE - MPF

Appendix 6. Minimum content for air monitoring results

In order for air monitoring results to provide usable information on the effectiveness of controls, properly assess workers' exposure to RCS and to demonstrate compliance with this Code and the WHS Regulation, the following information should be included:

1. **Qualifications**:
    a. Full name and post nominals of the COH/s (or recognised equivalent) who planned the air monitoring and interpreted the results.
    b. Full name and qualifications of the persons/s who conducted the air monitoring.
2. **Introduction**:
    a. Provide background, purpose, and objectives for air monitoring being undertaken.
3. **Process description**:
    a. Describe work processes, controls used, areas surveyed, tasks undertaken by workers (work patterns, task frequency, duration and conditions that may influence exposure).
    b. Description of workplace conditions, including environmental/weather conditions at the time of monitoring.
4. **Methods and measurements**:
    a. Establishment of SEGS and samples plan:
        i. Statistically valid sampling method used (e.g. EN689).
        ii. Description of similarly exposed groups (SEG), number of workers in each group and number of samples collected (from each SEG).
    b. Workplace exposure standard:
        i. The current WES for respirable crystalline silica (RCS), including shift-adjusted WES and model used (if applicable).
    c. Sampling equipment used:
        i. Make and model of size-selective sampler/s, sampling pump/s and flow meter/s.
        ii. Type of sample filters used and number of field blanks (Note: AS2986 requires a minimum of no less than two field blanks or 10 per cent of total filters used - whichever is greater).
        iii. Calibration, inspection and maintenance details for pump/s and flow meter/s.
    d. Details of sampling:
        i. Description or evidence of where size-selective sampler was located on worker/s.
        ii. Pre, post and average flow rates for each sample train.
        iii. Start and finish times for each sample train.

iv. Information on any invalid samples and reason for invalidation.

e. Details of analysis:

i. Method of sample analysis and laboratory details (e.g. lab name, FTIR or XRD).

5. **Results and discussion**:

a. Comparison of individual sample and SEG results against WES (shift adjusted if applicable).

b. Comments of efficacy of controls (includes observations of workers and controls being used during the sampling period).

c. Assessment of risk to workers health based on the results (e.g. using the method described in the AIOH Simplified Occupational Hygiene Risk Management Strategies).

d. Note: If available, results should also be compared with any previous surveys or data from similar premises and/or the scientific literature.

6. **Conclusions and recommendations**:

a. Conclusions should be drawn about whether or not the relevant exposure standard(s) have been exceeded and if the work could harm employee health. (Any issues of non-compliance with regulatory requirements should also be listed here).

b. Recommendations for any further controls to reduce workers exposure (following the hierarchy of controls).

c. Recommendation of ongoing sampling frequency.