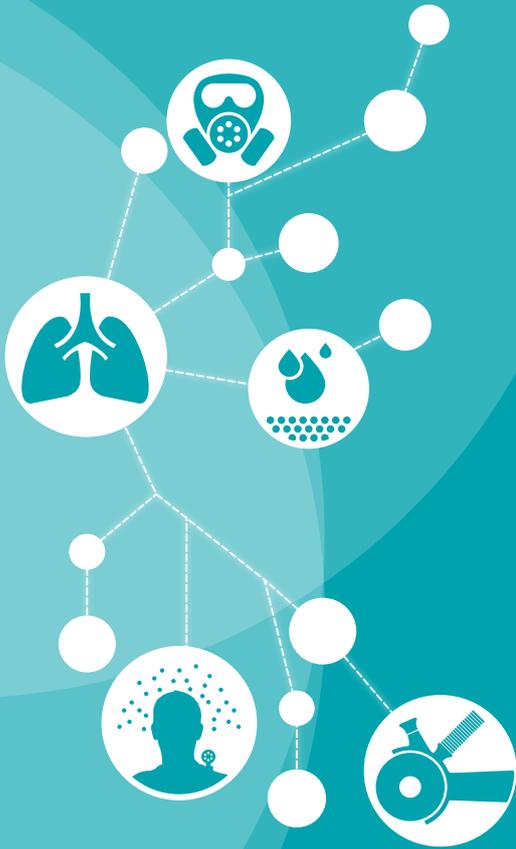


## Information for employers

# Managing respirable crystalline silica dust exposure in the construction industry



## What is silica?

Silica is a mineral found in the earth's crust. The crystalline form of silica which is called quartz has been associated with a variety of diseases primarily affecting the lung.

Crystalline silica is a common mineral found in:

- most rocks, sands, and clays
- products such as concrete, mortar, brick, blocks, pavers, tiles, natural and composite stone benchtops
- cement-based materials such as fibre-cement sheeting and autoclaved-aerated concrete.

Dust containing respirable crystalline silica (RCS) is generated by high-energy processes such as cutting, sawing, grinding, drilling, polishing, scabbling and crushing of silica-containing materials.

RCS particles are so small they cannot be seen under ordinary lighting and stay airborne long after larger particles have settled to the ground – the small particle size means it is easily inhaled deep into the lungs.

Certain work processes can also create RCS exposure risks, including housekeeping activities involving dry sweeping, compressed air or blowers on silica-containing dusts.

Construction or building material	Amount of crystalline silica (quartz)
Sand and sandstone	96 - 100%
Calcium-silicate bricks	50 - 55%
Aggregate in concrete	30%
Clay bricks	12 - 27%
Fibre cement sheets	10 - 30%
Demolition dust	3 - 4%

**Table 1: Typical concentrations of crystalline silica in building materials**

## Health risks

RCS is a hazardous chemical. Inhaling RCS can lead to silicosis, an incurable lung disease which can cause disability and death. RCS can also contribute to lung cancer, renal cancer and chronic obstructive pulmonary disease (COPD).

Silicosis usually follows exposure to RCS over many years, but extremely high exposures across the short-term can cause it to develop rapidly.

## Legislation

Persons in control of a business or undertaking (PCBUs) working with materials that create exposure to silica dust must ensure no-one's health is affected by that work. This includes:

- providing and maintaining a safe and healthy work environment
- providing and maintaining safe plant and structures for working with materials containing silica
- ensuring safe systems of work
- ensuring safe use of silica containing substances
- providing information, instruction, training and supervision
- ensuring the workplace conditions are monitored to prevent illness from carrying out work with silica.

Specific silica requirements are found in the Managing respirable crystalline silica dust exposure in the stone benchtop industry Code of Practice 2019, the Foundry industry Code of Practice 2004, the Abrasive blasting Code of Practice 2013, and the Workplace Exposure Standards and their guidance.

## Induction, information, training and supervision

The PCBU must provide induction, and training about silica hazards and must supervise the safe use of silica hazards in the workplace. Information provided should cover:

- the health risks from inhaling RCS
- where to gain information about RCS (e.g. safety data sheet or labels)
- how the work operations will expose workers
- how the control processes are intended to operate
- any use of respiratory protection and worker respirator fit and check processes
- what air monitoring results indicate
- the health monitoring process and the health monitoring report
- accessing all appropriate records on their work with and exposure to RCS.

The training given has to take into account the level of risk posed by the RCS exposure. Keep a record of who was trained, who conducted the training, when it was given, and the topics covered.

## Health monitoring

You must ensure health monitoring is provided to workers who are carrying out ongoing work using, handling, generating or storing RCS and there is a significant risk to the worker's health because of exposure. Further guidance on determining significant risk can be found in Safe Work Australia's *Health Monitoring for Exposure to Hazardous Chemicals - Guide for persons conducting a business or undertaking*.

## Controlling the dust

Where elimination or substitution of RCS materials or work processes is not practical, engineering controls such as dust extraction and water suppression must be used in addition to suitable respiratory protection. Common control options:

### On-tool extraction

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

### Water suppression

Water or fine mist suppression can also be used to control RCS dust when LEV is not suitable. However, it needs to be used correctly.

This means enough water supplied at the right levels for the whole time that the work is being done. Just wetting the material beforehand does not work. Examples for use include wet cutting methods for brick, tile, stone and concrete.

## Isolation

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.

RCS work processes should be done outdoors away from other workers where possible. Indoors, separate the RCS work processes from other work activities where possible.

## Respiratory protective equipment (RPE)

RPE does not prevent or control RCS from becoming airborne. It should not be used as the primary means of control, but rather in combination with higher order controls like LEV or water suppression.

It is important to choose the right respirator for the job. The fit of a respirator to a worker's face is critical. Have workers fit tested to ensure the respirator is comfortable and capable of giving the right level of protection. The amount of time the respirator is worn also needs to be considered.

Selection of RPE should be undertaken in accordance with *AS/NZS 1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices*.

## Record-keeping

A workplace exposing workers to RCS will produce a number of documents which must be kept for significant time periods and be available for inspection by various parties. These records must be kept for a period of 30 years from the day a document was made:

- an air monitoring result (WHS Regulation Section 50). These records for respirable dust and silica must be readily accessible to those workers who have been exposed to the silica
- a health monitoring report (WHS Regulation Section 378). The period here is for at least 30 years after the record is made, but it may be longer.

Workers who have been exposed at the workplace to silica must be permitted ready access to their exposure records. A useful procedure for workers exiting a workplace where air monitoring and health monitoring have been carried out would be to provide those workers with copies of each relevant report pertaining to a worker. All air monitoring and health monitoring records may also be reviewed by a Workplace Health and Safety Queensland inspector as part of an inspection process.

## For more information

Call **1300 362 128** or visit **worksafe.qld.gov.au** and search for silica.