



BREATHE FREELY New Zealand
Pūkahukahu Mahea Aotearoa

Managers Toolkit
Engineered Stone Silica Dust



Managers Toolkit 

Let's Talk:
Silica Dust - Working
with Engineered
Stone



What is the concern about Engineered Stone ?



Engineered stone is ground stone such as crystalline silica and combined with resin. The crystalline silica content in stone bench tops can vary widely depending on the type of stone used.

Engineered stone bench tops can contain up to **95** per cent crystalline silica. Natural stone such as granite may contain from 20 to 60 per cent.

It is the respirable crystalline silica (RCS) released into the air which causes silicosis.

NO AIRBORNE RCS, NO SILICOSIS

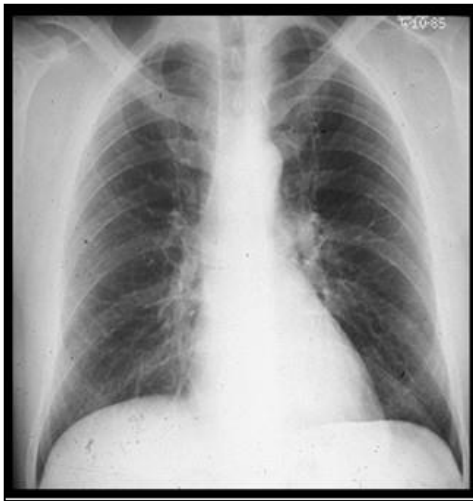
*Regulators are visiting workplaces which fabricate engineered stone.
Make sure your work practices complies with HSWA requirement to
minimise RCS exposures.*



What are the health effects ?

Exposure to respirable silica dust can lead to the development of:

- Silicosis (an irreversible scarring and stiffening of the lungs)
- Accelerated silicosis.
- Progressive Massive Fibrosis (PMF)
- Chronic Obstructive Pulmonary Disease (COPD) often observed as emphysema and bronchitis
- Lung cancer
- Kidney disease
- Auto-immune diseases such as rheumatoid arthritis



PMF

Cases of accelerated silicosis have recently been published in the news media, occurring specifically in workers in the engineered stone industry.

It is estimated that 230* people develop lung cancer each year as a result of past exposure to silica dust at work. Not all exposed workers will develop cancer; cancer risk increases with long term or repeated high level exposure.

*Cancer Council Australia

Health Risks from Exposure

Fabrication and Installation



Images supplied by Queensland Government

RCS exposures can occur when processing engineered stone such as cutting, grinding, sanding and polishing during the fabrication and installation of stone bench tops.

Fabrication workers are at higher risk compared to installers because they carry out dust producing activities for most of their shift. Installers still need to follow good work practices using wet methods, good ventilation and RPE.

Where no cutting, grinding, sanding or polishing of the benchtop occurs during installation then no RCS will be released.



Uncontrolled DRY processing which includes cutting, grinding or polishing is not allowed. Dust control measures **MUST** be in place.



Dry cutting, grinding or polishing stone generates very high levels of dust containing RCS. These tasks require tools equipped with water suppression or exhaust ventilation systems built into the tools

Engineering controls must be implemented. For example, best practice to minimise worker exposure is by automated cutting equipment with water suppression.

Water suppression is generally better at reducing dust levels than using dry methods with local exhaust ventilation

Half face respirators alone cannot protect the workers.

Water Suppression (1)



Images supplied by Queensland Government

Only use tools and machinery that have been specifically designed for use with water attachments -

- Use bridge saws fitted with water attachments to suppress dust when cutting slabs.
- Use water suppressed routers, water jet cutters or bridge saws to complete sink and stovetop cut outs.
- Use hand-held angle grinders fitted with multiple water feeds to deliver water to the cutting disc and point of contact with the stone.
- Use water suppressed wet-edge milling machines or polishing machines.
- Use polishers with a centre water feed to polish or grind stone.



Images supplied by Queensland Government

Water Suppression (2)

- Use an adequate number of water feeds directed at the material and/or tool to prevent visible dust during the process.
- Maintain an adequate water pressure to make sure water is reaching the material and/or tool.
- Control water spray from water suppressed tools and machinery using guards, plastic flaps or brush guards.
- Prevent workers from being able to turn water suppression systems down or off during operation.
- Ensure water used for dust suppression is clean.
- Recycled water should be treated through a system that includes an appropriate micron filter.



Images supplied by NSW Government

Local Exhaust Ventilation



Images supplied by Hilti Australia

- Only use tools and machinery that have been specifically designed for local exhaust ventilation attachments.
- Use hand tools (for example drills, circular saws, grinders) equipped with on tool dust extraction, which typically consists of a shroud and a suction attachment point.
- The tool must be connected via the attachment point, to an H class rated vacuum or dust extraction system fitted with a disposable bag. Standard AS/NZS 60335.2.69, fitted with a filter that can achieve an efficiency of 99.995% (eg H14 HEPA filter complying with Standard AS 4260).
- Install fixed, portable or flexible capturing hoods to capture dust at the point of generation. Best results are with tools designed with extraction build in.

*Make sure your work practices complies with
HSWA and regulation requirements to minimise
RCS exposures*



Isolate workers from dust generating processes



- Provide distance between the work process and the worker (for example operators positioning when using bridge saws or routers)
- Provide distance between workers using powered hand tools and other workers at the workplace.
- Provide physical barriers between different workers and workstations to prevent the water mist moving into other work areas or towards other workers.
- Provide workers with a separate room or area away from the fabrication area for food preparation and dining.

Images supplied by Queensland Government



Work Practices

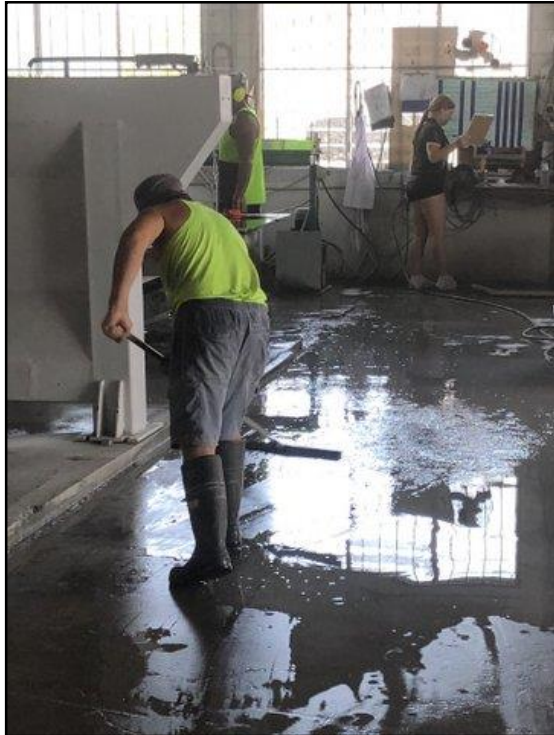
- Use routers or water jet cutters for sink and stovetop cut outs and edge or surface polishing machines for edge polishing.
- Wet slabs before cutting, grinding or polishing to aid with dust suppression.
- Capture all water generated from water suppressed processes through curbing and channelling.
- Prevent water pooling and drying on surfaces leaving dry dust deposits.
- Wash hands and face thoroughly before eating, drinking or leaving the workplace.
- Launder dusty or contaminated work clothes at the workplace or use a commercial laundry to avoid taking them home.



Images supplied by Queensland Government



Cleaning and Housekeeping



Images supplied by Queensland Government

- No dry sweeping or compressed air to clean surfaces or clothing.
- Implement daily and thorough housekeeping and cleaning procedures for water slurry and settled dust.
- Use low pressure water, wet sweeping or with dry dust in certain cases, H class rated vacuum cleaner fitted with a disposable bag, to clean floors, walls and other surfaces.
- Regularly clean vehicle track or high use areas and keep them wet during the day.
- Provide hoses for cleaning between tasks.
- Place wet slurry in a container, bag or bin with a lid for disposal.



Personal Protective Equipment



- Provide workers with gum boots, waterproof jackets or aprons to protect from water splashes and prevent contamination of clothing .
- Decontaminate clothing by removing excess dry dust, in certain cases, with H class vacuum cleaner fitted with a disposable bag, before leaving processing area.
- After each shift, workers can change their clothing that has been contaminated with silica dust and these should be washed separately from other clothing.
- Launder dusty or contaminated work clothes at the workplace or use a commercial laundry to avoid taking them home. Inform laundry that clothes are contaminated with respirable silica dust.

Respiratory Protect Equipment (RPE)



- Suitable_RPE must be worn with the appropriate level of protection.
 - Check the SDS or supplier's recommendations. Air monitoring can be used to determine the levels of exposure and the appropriate RPE.
 - Make sure that the respirator meets performance standards eg AS/NZS 1716, NIOSH or CEN and not a cheap copy.
 - Powered Air Purifying Respirators (PAPR) like those shown in the picture, using a P3 filter, are much more effective than negative pressure respirators as they eliminate the concerns of poor face fit from beards & stubble, as well as different shaped faces.
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- **Workers report PAPR are much more comfortable to wear, especially during hot weather and for a full shift.**
 - **Some PAPR can be worn by workers without the wearer being clean shaven.**

Fit-testing of Respirators

- Best practice means workers must pass a fit-test before they start wearing a tight-fitting respirator.
- Fit-testing measures the effectiveness of the seal between the respirator and the wearer's face.
- Facial hair can stop a tight-fitting respirator from sealing correctly.
- Men must be clean-shaven or only have facial hair that doesn't sit beneath the seal or interfere with the valve.
- Loose fitting respirators don't need to be fit-tested.
- Fit-test should be repeated each year.



Image courtesy of the Queensland Government

RPE Training

When issuing RPE, training is required to ensure that workers correctly use and maintain RPE.

Training must be provided by a competent person, and 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 FIT CHECK
- How to clean and maintain RPE
- When and how to replace filters
- How and where to store RPE when not in use.



Workers need to be clean shaven when wearing tight fitting half face or full face respirators



Risk Assessments - Air Monitoring

Air monitoring can be used to check on respirable silica dust levels and the effectiveness of the controls and work practices.

Monitoring must be performed by a competent occupational hygienist. Check the website: <https://nzohs.org.nz/member-directory/alphabetical/>

Best practice with controls, results in exposures below 50% Worksafe NZ (WES) for respirable crystalline silica. Exposures must be below the WES.



Courtesy of Qld Dept of Natural Resources Mining and Energy

Results must be provided to the workers and made available for the occupational medical practitioner's performing the medicals



Worker Training Awareness

Workers must be trained and aware of the:

- Health hazards of respirable silica dust
- How to use and maintain the water assisted equipment and / or extraction systems to prevent release of dust.
- How to wear and maintain RPE, see RPE training
- Housekeeping and washing overalls
- Clean-up with water and vacuum cleaners
- Health Monitoring





Health Monitoring of Engineered Stone Workers



All workers in NZ exposed to respirable crystalline silica from engineered stone dust should have annual health monitoring.

All records should be shared with the employee and held by the employer.



Health Monitoring of Engineered Stone Workers

This has been covered in detail in the second module titled Silica Dust – Health Monitoring, also under Engineered Stone.

Health monitoring must be done or supervised by a occupational health practitioner with experience in worker health monitoring.

These lists are not exhaustive and other health practitioner may have the necessary experience required to conduct health monitoring for RCS

Make sure you understand your obligations as per HSWA and regulations.



Summary RCS Hazard Management (1)

1. Identify workers exposed to RCS dust during fabrication and installation.
2. No uncontrolled dry cutting, grinding or polishing.
3. Slabs should be wet before cutting, grinding or polishing.
4. Only use tools with water dust suppression or localised dust extraction fitted with disposable bag.
5. Do not cut without the saw being water fed.
6. Use local extraction ventilation, which is serviced and maintained.
7. Adequate distance between the work processes.
8. Use only appropriate RPE for dust exposure levels and consider Powered Air Purifying Respirators (PAPR) as option.
9. RPE and Equipment - workers trained in correct use and fit tested for RPE.
10. Risk assessments - air monitoring is used to check on respirable silica dust levels and effectiveness of controls. Results of air monitoring are communicated to staff.



Summary RCS Hazard Management (2)

11. Dusty clothes are washed or vacuumed at the workplace.
12. In certain cases, Hclass rated vacuum cleaner, fitted with a disposable bag can be used to clean dry dust on floors, walls and other surfaces to clean up dust.
13. Use low pressure water, or wet sweeping to clean.
14. Filter recycled water.
15. Provide facilities to wash face and hands.
16. Health surveillance is provided where there is a risk and complies with WHS regulations.
17. Perform air monitoring to check that RCS levels and effectiveness of workplace controls including RPE.
18. Records of instruction, risk assessments & air monitoring as well as training are maintained. Also, records on health monitoring services and information provided are managed appropriately.



Reference Material (9 June 2020)

1. <https://worksafe.govt.nz/topic-and-industry/dust/silica-dust-in-the-workplace/>
2. <http://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976660.html>