

# Occupational Cancer Risk Series

## Silica dust



**There may be hazards where you work that increase your risk of developing cancer. This fact sheet discusses occupational hazards related to silica dust.**

### Key messages

- Working with silica-containing materials can increase your risk of developing lung cancer.
- It's the dust you cannot see that can damage your lungs.
- Eliminate or reduce exposure to silica dust by using the recommended controls.
- Refer to [Silica – Technical Guide to Managing Exposure in the Workplace](#) for more information on how you can control silica dust hazards.

### What is silica dust?

Crystalline silica is found in stone, rock, sand, gravel and clay, as well as products such as bricks, tiles, concrete, artificial stone benchtops and some plastic materials (Figure 1). When these materials are worked on, the silica is released as a fine dust. This dust is respirable crystalline silica (commonly called silica dust).

### Silica dust and cancer

Silica dust is harmful when it's breathed in; it is 100 times smaller than a grain of sand, so you can be breathing it without knowing. This can lead to lung cancer, silicosis, chronic obstructive pulmonary disease and kidney disease. It is estimated that each year 230 people develop lung cancer due to 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.

### Work jobs and exposure

In 2011 about 587,000 Australians were exposed to silica dust whilst working<sup>1</sup>. It is estimated that 5758 of these workers will develop lung cancer over the course of their life. Those at greatest risk are miners, construction workers, farmers and engineers.

You may be exposed to silica dust if your work involves:

Breaking, crushing, grinding or milling silica-containing material	Using or fitting some plastic composite products	Moving earth e.g. excavating, mining, quarrying, tilling or tunnelling
Sand blasting	Brick-laying	Sand casting
Paving, surfacing and cement finishing	Mineral-ore treating processes	Laying, maintaining or replacing ballast
Road construction	Demolition	Stonemasonry
Manufacture of glass, ceramics, concrete, tile, coke, metals, steel metal casting or mineral products	Drilling, cutting, chiselling or sanding silica-containing material	Handling, mixing or shovelling dry silica-containing material

### Effective controls

All Australian workplaces must follow work health and safety laws; however these vary slightly between states and territories, but the duty of care for employers and responsibilities of workers across Australia is similar:

- Employers are required to ensure the health and safety of their workers at their workplace.
- Within reason, workers must take care of their own health and safety, not negatively affect that of others and follow instruction and workplace health and safety policies.



Figure 1: Common silica-containing materials and job tasks where you may be exposed to silica dust

Eliminate or reduce exposure to hazards by following the [risk management process](#) and using the hierarchy of control (Figure 2). Workers should always be involved in the process to correctly identify hazards and control measures that suit the workplace and task. If suitable control measures are not in place, anyone working around silica dust has an increased risk of developing lung cancer.

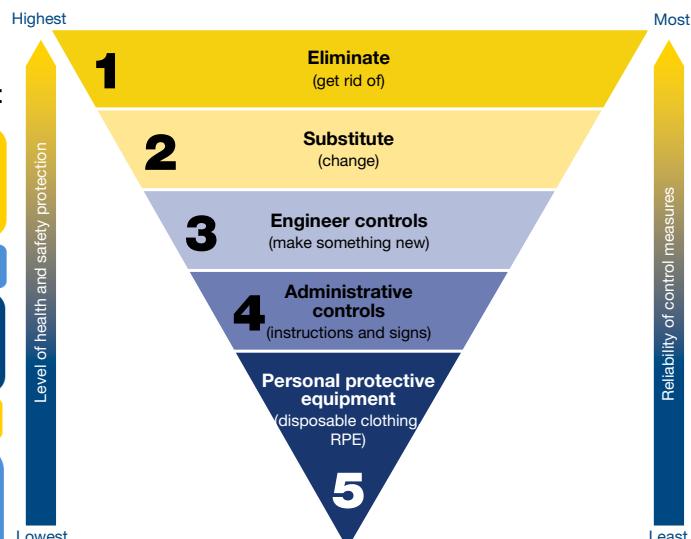


Figure 2: Hierarchy of risk control

All questions. All cancers. 13 11 20 [www.cancer.org.au](http://www.cancer.org.au)

<sup>1</sup>Carey RN, Driscoll TR, Peters S, et al. Occup Environ Med 2014;71:55–62.

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Workers must be given information and training on:

- Control measures and how to use them (summarised in Table 1). The Health and Safety Executive in the U.K also have [fact sheets](#) that are specific to job tasks.
- Possible health effects of silica dust exposure.
- Health surveillance.

## Air monitoring

The mandatory limit for silica dust exposure in Australia is 0.1mg/m<sup>3</sup> averaged over an eight-hour day. The [ACGIH](#) have recommended the threshold limit value be 0.025mg/m<sup>3</sup> over an eight-hour day. This limit was based on the prevention of lung cancer and silicosis. However, there is currently no evidence to suggest a safe level of silica dust exposure. Work Health, and Safety (WHS) [Regulation 50](#) states air monitoring (by an [occupational hygienist](#)) must be conducted if there is a possible risk to health or if there is potential of exceeding the exposure limit. However, exposure levels in settings like construction sites are always changing and air sampling alone is not enough.



Figure 3: Breathing in more than the amount of silica dust shown in this picture, per day, means you have exceeded the exposure limit of 0.1mg/m<sup>3</sup>. Source: [HSE](#).

## Health surveillance

WHS Regulations state that [health monitoring](#) must be provided to workers who are continually working with silica dust and there is a significant risk to the worker's health. Safe Work Australia's [crystalline silica health monitoring guide](#) outlines how to monitor workers. Health monitoring can help to detect loss in lung function before permanent damage. Surveillance should be undertaken before job placement and at least every three years (yearly for [high-risk jobs](#)).

For any concerns related to control measures at your workplace, or for more information on the control of air quality contact:

- your workplace supervisor or management (if you're an employee)
- your workplace health and safety representative or union representative
- state and territory work health and safety regulators
- Safe Work Australia

## How do I detect cancer early and reduce my cancer risk?

Prevent silica dust exposure by keeping the dust out of the air. If you think you have been exposed to a cancer causing agent it's important you speak with your doctor. To find out what you can do to help reduce cancer risk, contact Cancer Council on 13 11 20 or visit [cancer.org.au](#).

Table 1. Summary of control measures for silica dust

ACTIVITY	CONTROL
Construction, planning and design	For example, by: <ul style="list-style-type: none"><li>• using other materials (e.g. autoclaved aerated concrete) in place of concrete masonry</li><li>• planning buildings with pre-built recesses for plumbing, gas and electric wiring</li><li>• ordering the right size materials</li><li>• getting materials cut to size off-site</li></ul>
Select the correct equipment	<ul style="list-style-type: none"><li>• Use fibre cement sheet shears instead of circular saws.</li><li>• Ensure the rock-drilling machines have dust suppression features.</li><li>• Vehicles (i.e. tractors, excavators and bulldozers) should have a dust collection system and an air conditioned cab with a filtered air supply. Filters should be cleaned and maintained regularly.</li></ul>
Use workshop ventilation	Have enclosures or hoods and <a href="#">local exhaust ventilation</a> (LEV) to remove the dust at the point it's produced.
Abrasive blasting	WHS Regulations do not allow abrasives containing silica. Use metallic shot, slag products (ilmenite, garnet or staurolite) instead of sand. During blasting, containment methods such as blast-cleaning machines, cabinets and LEV should be used.
Ensure tools have on-tool extraction	Use LEV that fits directly onto hand-held machines. This is the most effective way of controlling dust.
Use water suppression when possible	Water suppression should be used whenever possible; especially when LEV is not suitable. Water should be used through non-electric tools to wet dust down at the point of dust generation. For example, water should be provided to the blade when using saws; just wetting the material is not enough. Ensure equipment and work areas are cleaned regularly with water. Use water spray or rubber curtains around conveyor transfer points.
Know how to use your respiratory protective equipment (RPE) correctly	<ul style="list-style-type: none"><li>• No RPE can prevent all silica dust from being breathed in. So, RPE should be used in combination with other controls.</li><li>• RPE cannot protect you if it doesn't fit properly. Employers should have workers fit tested and trained in their use and maintenance. This is even more important if you have facial hair.</li><li>• It is important to choose the right RPE for the job; use the <a href="#">AS/NZS 1715:2009</a> standards or watch this <a href="#">HSE video</a> for guidance on the selection and use of RPE.</li></ul>
Quit smoking	Smoking reduces the lung's ability to clear dust and increases the risk of lung cancer. Potentially exposed workers should quit.
Wear the correct PPE	If possible wear disposable clothing at work. Before you leave work, shower and change into clean clothes. Do not take your dusty clothes home to wash.
Reduce exposure using administrative controls	Display warning signs if tasks create silica dust. Rotate staff to limit the time they are exposed. Locate silica dust work outdoors, away from other workers who are not required for that task.
Clean-up correctly	DO NOT 'clean up' with compressed air or by dry sweeping. Dust should be removed using an industrial HEPA (high-efficiency particulate air) filter vacuum, which should be cleaned and maintained regularly.

For more information visit the 'useful websites' listed on [cancer.org.au/workcancer/silica-dust](#)