

FACT SHEET

SILICA DUST IN CONSTRUCTION

Construction work can produce silica dust. Exposure to silica dust is dangerous and can cause serious lung disease. Remove silica dust from a worksite, or control any exposure to ensure worker safety.

WHAT IS SILICA?

Silica is a natural substance found in materials on construction sites, such as concrete, bricks, rocks, stone, sand and clay. Dust containing silica is created when these materials are cut, ground, drilled or otherwise disturbed. If the silica particles in this dust are small enough (**known as respirable crystalline silica or RCS**)¹ it can be breathed deep into the lungs and cause damage. The dust that can be breathed in is not always visible to the naked eye.

Tasks which may expose construction workers to silica dust include:

- > Sawing, hammering, sanding, drilling, grinding and chipping concrete or masonry (bricks, stone and fibre cement products).
- > Demolishing concrete and masonry structures.
- > Abrasive blasting of concrete and other materials (especially where sand is used as the abrasive).
- > Dry sweeping or the pressurised air blowing of concrete and rock.
- > Chipping, hammering and drilling rock. Also the crushing, loading, hauling and dumping of rock.

HOW DOES EXPOSURE TO SILICA DUST HARM HEALTH?

Lung disease can develop from breathing in dust that contains silica.

Silicosis: Breathing in silica dust can cause the lung tissue to scar, a condition referred to as silicosis. This scarring results in a loss of lung function, usually characterised by breathlessness. The effects of silicosis are permanent and may continue to develop even after exposure has stopped.

Once silicosis has developed, there could be an increased risk of kidney disease and tuberculosis.

Chronic obstructive pulmonary disease

(COPD): COPD is a term that refers to a chronic lung condition that can result from breathing in silica dust. It can lead to breathing difficulties.



Dust exposure while working with fibre cement products.

¹ Reference in this factsheet to silica dust is to respirable silica dust or RCS.

Lung cancer: If a worker has a lengthy exposure to high levels of silica dust, lung cancer may develop. Once silicosis has been diagnosed, the risk of lung cancer increases.

Important note: Lung disease can be caused by both long term exposure to small or moderate levels of silica dust, and short term exposure to high levels of silica dust. It is also important to note that smoking adds to the lung damage caused by silica dust exposure.

WHAT ARE EMPLOYERS' RESPONSIBILITIES?

Employers have a legal duty to take all practicable steps to ensure employees are safe at work.² Exposure to silica dust is a workplace hazard that employers must eliminate, isolate or minimise.

As an employer, you should be able to recognise where work tasks may create silica dust. You should then plan ahead to remove the dust or control any worker exposure.

Where silica dust is created on a worksite, you should implement: **Dust control methods; Respiratory protection; Air monitoring; Health monitoring; Protective clothing; Warning signs; Training.**

Dust control methods

The key to preventing silica exposure is keeping silica dust out of the air.

- > Use water. Water and wet working methods can keep silica dust out of the air, and out the lungs of your workers. Make water hoses available to wet any dust created before it becomes airborne. Water hoses should always be used, rather than compressed air.
- > Ensure equipment and affected work areas are frequently cleaned with a water hose to protect nearby workers from dust exposure.
- > Do not dry sweep. Dust should be removed from work areas using vacuums with filters (high-efficiency particulate air (HEPA) filters).

- > Look for dust control features and dust collection systems when purchasing construction equipment. Purchase equipment and tools with water attachments and/ or vacuum attachments to control dust at the source. For example, saws used on concrete and masonry should provide water to the blade; machinery (ie excavators and bulldozers) should have a dust collection system and an air conditioned cab with a filtered air supply, to isolate the operator from dust.
- > Ensure your workers always use dust control features and dust collection systems on equipment. If these are not working properly, your workers should not use the equipment.
- > Abrasives used during abrasive blasting should not contain silica. Use metallic shot, slag products or grit for abrasive blasting, instead of sand.
- > During abrasive blasting, containment methods such as blast-cleaning machines, cabinets, and local exhaust ventilation should be used.

Respiratory (breathing) protection

Respirators should be used together with other dust control methods, not as the primary way to prevent exposure to silica dust.

- > Provide certified respirators and make sure your workers use them to protect their lungs from silica dust.
- > Ensure the correct respirator is used for the job (dependent on dust levels and particle size). Provide either: a disposable respirator; a half-face respirator; a full-face respirator (this type filters the air); a full-face powered respirator (this type supplies clean air).

² Health and Safety in Employment Act 1992, s 6.



Disposable respirator (for low to medium dust levels)



Half-face respirator (for low to medium dust levels)



Full-face respirator (for medium dust levels)



Full-face powered respirator (for high dust levels or people with facial hair)

Disposable respirators should have two straps which fit securely around the face to ensure sufficient protection from dust.

In construction, usually a disposable or half-face respirator will provide sufficient protection. However, when work tasks involve abrasive blasting, airline respirators will be required.

- > When respirators are used at a worksite, you should: carry out facial fit testing on each worker; carry out appropriate maintenance on all respirators to ensure they remain fit for purpose; provide training on the correct use of respirators; keep records that detail respirator use; store respirators in a clean cupboard when they are not in use.

Note: Facial hair (beard, stubble growth, moustache or sideburns) or wearing glasses might affect the respirator's ability to form a tight seal around the face. It is best that men are clean-shaven if they have to wear respirators for work (or they wear a full-face powered respirator).

Air monitoring

- > Carry out air monitoring to measure the overall amount of silica dust created at various positions on the worksite and the maximum level of worker exposure (given the use of dust control methods, respirators and other measures). Air monitoring can be carried out by occupational hygienists or other trained personnel. This monitoring will help you select the most appropriate dust control methods and respiratory protection for your workers.
- > Carry out air monitoring on a regular basis to ensure dust control methods in place remain effective and provide adequate protection for your workers. It is particularly important to carry out air monitoring when new work methods are introduced.

Health monitoring

- > Provide ongoing health surveillance for all your workers who may be exposed to silica dust. Surveillance should include lung function testing and a respiratory questionnaire. Occupational health nurses can provide this service.

Protective clothing

- > It is vital that dusty clothes do not contaminate cars, homes and other areas outside of the worksite.
- > Ensure your workers have disposable or washable clothes to change into at the worksite.
- > Ensure that before your workers leave the worksite they shower (if possible) or wash with water, and then change into clean clothes. Do not allow your workers to take dusty clothing home to wash. If you are washing this clothing, take care that dust exposure does not occur.

Warning signs

- > Post warning signs to mark the boundaries of work areas where silica dust is created. These signs should warn your workers about the hazard and specify any protective equipment required.

Training

- > Provide your workers with training on silica dust. All training should include information about: the health effects of exposure to silica dust; work practices to follow when silica dust is created at a worksite; the appropriate use and care of protective equipment (including protective clothing and respiratory protection).

HOW CAN EMPLOYEES' PROTECT THEMSELVES?

Employers do not have the sole responsibility to manage exposure to silica dust at work. Employees must take all practicable steps to keep themselves, and other people around them safe.³ As an employee, you should be able to recognise if work tasks that you (or those near you) carry out create silica dust. Where this applies, you should:

- > Follow any dust control methods that your employer has put in place. This includes: frequently cleaning affected equipment and work areas; using dust control features and dust collection systems on equipment and tools; reporting any failures of dust control features and dust collection systems on equipment and tools, then stopping any use.
- > Correctly wear the respiratory (breathing) protection your employer provides. This includes ensuring it is clean and fits properly. To ensure a close-fitting respirator, remove facial hair. A respirator cannot protect you if it doesn't fit properly, so make sure that facial fit testing has been carried out by your employer.

- > Test the respirator seal by carrying out a negative or positive pressure fit test each time you use it.
 - Carry out a **negative pressure seal check** by putting the respirator on and inhaling sharply, while blocking the paths for inhaled breath to enter the facepiece. A successful check is when the facepiece collapses slightly due to the negative pressure created.
 - Carry out a **positive pressure seal check** by putting the respirator on and exhaling gently, while blocking the paths for exhaled breath to exit the facepiece. A successful check is when the increased pressure in the facepiece causes outward air leakage.
- > Wear washable or disposable protective clothing at work. Before you leave the worksite, shower (if possible) or wash, and then change into clean clothes. Do not take your dusty clothes home to wash.
- > Follow good personal hygiene practices. This includes: not eating, drinking or smoking in dusty areas; washing your face and hands before eating, drinking or smoking outside dusty areas; parking your car in an area that will not be contaminated by dust.
- > Participate in health monitoring and training provided by your employer. You are entitled to look at the results of this monitoring whenever you choose to do so.

FURTHER INFORMATION

This fact sheet has been developed using guidance from:

- > **Health and Safety Executive (UK)**
www.hse.gov.uk
- > **National Institute for Occupational Safety and Health (USA)** www.cdc.gov/niosh
- > **WorkCover NSW (AUS)**
www.workcover.nsw.gov.au

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³ Health and Safety in Employment Act 1992, s 19.