

Silica is naturally occurring and is used in many products across a variety of industries and workplaces. Crystalline silica is most dangerous to health when dust is generated, becomes airborne and is then inhaled by a worker. Some dust particles can be so small that they are not visible.

Crystalline silica (silica) is found in sand, stone, concrete and mortar and is also used to make a variety of products. When workers cut, crush, drill, polish, saw or grind products that contain silica, dust particles are generated that are small enough to lodge deep in the lungs and cause illness or disease including silicosis (lung inflammation, scarring and shortness of breath) and lung cancer. Silicosis can occur after short term exposure to very high levels of silica dust or chronic exposure to lower levels over years.

## 1.1 Products

Silica can be found in a variety of products across a range of industries. Examples of products include;

- Manufactured solid stone products such as composite (engineered) stone benchtops
- Asphalt
- Cement, mortar and grout
- Concrete, concrete blocks and fibre cement products
- Brick
- Drywall and some plasterboards, and
- Pavers and tiles including roof tiles

To manage the risks associated with silica, you must first identify where workers will be exposed. A label or Safety Data Sheet should be able to tell you if a product contains silica. The supplier of a product should also be able to tell you how much silica is present.

## 1.2 Activities

Examples of activities that release silica dust into the air include:

- During fabrication and installation of composite (engineered or manufactured) stone countertops
- Excavation, earth moving and drilling plant operations
- Clay and stone processing machine operations
- Paving and surfacing
- Mining, quarrying and mineral ore treating processes. Exposure to silica dust is a known issue, with a high risk of worker exposure during rock crushing activities
- Tunnelling
- Construction labouring activities
- Brick, concrete or stone cutting; especially using dry methods
- Abrasive blasting
- Drilling, angle grinding, jack hammering and chiselling of concrete or masonry
- Hydraulic fracturing of gas and oil wells

If you have identified silica dust may be generated as part of your work practices, you should consider:

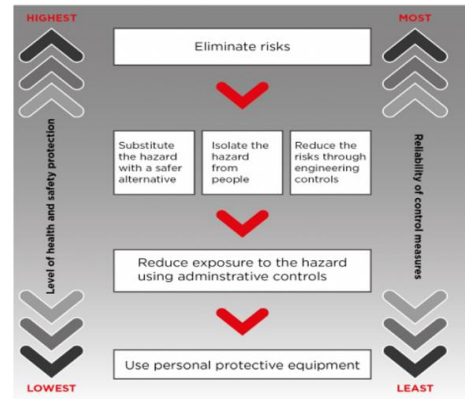
- how, where and for how long workers could be exposed to silica dust
- the control measures you have in place to control the dust, and
- the ways you can measure how well your control measures work.

The workplace exposure standard for respirable crystalline silica must not be exceeded. In Australia this is 0.05 mg/m<sup>3</sup> and in New Zealand it is 0.1mg/m<sup>3</sup> over an 8-hour time-weighted average concentration.

If you are not certain of the airborne concentration and if you will be exceeding the exposure standard, air monitoring must be carried out. Health monitoring for workers must also be provided for workers if they carrying out ongoing work using, handling, generating or storing crystalline silica and there is a significant risk to the worker's health due to exposure.

## 1.3 Control Measures

When deciding on control measures to manage the risk associated with silica, the hierarchy of controls should be followed. You may need to implement a combination of different control measures to eliminate or minimise generating silica dust. If you rely solely on one control measure, such as PPE, there may be a significant risk to your worker's health.



Eliminate	<ul style="list-style-type: none"> <li>Adopting production processes that do not generate dust</li> </ul>
Substitution	<ul style="list-style-type: none"> <li>Use products that do not contain silica or have less silica in them</li> <li>Use a silica containing product that does not need to be cut, ground or polished, and</li> <li>Use a liquid or paste form of a silica product</li> <li>Adopting production processes that generate less dust</li> </ul>
Isolation	<ul style="list-style-type: none"> <li>Isolating high dust generation work processes within an enclosed room with restricted access</li> <li>Providing physical barriers and exclusion zones between different workers and workstations to prevent dust or water mist from moving into other work areas or towards other workers</li> <li>Distancing a work process from other workers -for example consider where other workers are working when powered hand tools are used</li> <li>Designating a room or area for other tasks such as changing or eating, away from the work area.</li> <li>Use barriers around automated tasks to shield workers from silica dust.</li> </ul>
Engineering	<ul style="list-style-type: none"> <li>Treating the dust on its transmission path using dust suppression techniques</li> <li>Automation when cutting, grinding or drilling</li> <li>Using wet cutting methods</li> <li>Local exhaust ventilation</li> <li>Drills, routers, saws and other equipment designed to be fitted with H-class local exhaust ventilation and a water attachment to suppress dust</li> <li>Using sacrificial backer-boards or spoil boards</li> <li>Fitting large machinery such as excavators and bulldozers with positive pressure enclosed cabs</li> <li>Cleaning up dust with an M or H-class industrial vacuum cleaner.</li> </ul>
Administrative	<ul style="list-style-type: none"> <li>planning cutting tasks to make sure the minimum number of cuts are made</li> <li>written rules and policies for working with silica or cleaning silica waste                             <ul style="list-style-type: none"> <li>for example having a written clean-up procedure and log</li> </ul> </li> <li>a maintenance schedule and log for equipment and PPE</li> <li>a job rotation schedule so that the same workers are not continually exposed to silica, and</li> <li>restricted area policies so that only staff who are carrying out a task that generates silica dust are allowed access to high risk areas</li> </ul>
PPE	<ul style="list-style-type: none"> <li><b>Never rely solely on PPE to protect workers from silica dust.</b></li> <li>make sure the PPE you provide is appropriate (check the SDS if one is provided)</li> </ul>