Safe Work Instruction
Crystalline Silica

SPRY & HONNER

PURPOSE:

Dust containing crystalline silica in general construction work.

Identify hazards and control the risks of exposure to dust containing crystalline silica in construction.

INTRODUCTION:

What is crystalline silica?

Crystalline silica is a natural mineral found in construction materials such as concrete, bricks, tiles, mortar and engineered stone.

The amount of crystalline silica in products can vary. Examples include:

- brick: 5-15%
- concrete: less than 30%
- ceramic tiles: 5-45%
- reconstituted stone: more than 80%

Check the product safety date sheet (SDS) is find if the product contains crystalline silica.

Silica dust

Dust containing crystalline silica particles is commonly called silica dust.

It can be released when you cut, grind, sand, saw, drill, load, transport, dump or simply disturb materials that contain crystalline silica. Some particles are too small to see and can be inhaled deep into the lungs.

Health risks

Silica dust can be harmful when it's inhaled into your lungs over a long period of time at low to moderate levels, or short periods at high levels. Exposure can lead to serious diseases, including:

- silicosis - irreversible stiffening of the lungs
- lung cancer
- chronic obstructive pulmonary disease
- kidney disease

Exposure standard

The Australian exposure standard for airborne crystalline silica is 0.1mg/m3 over an 8-hour day. This limit is based on preventing silicosis and lung cancer.

Construction tasks and exposure

Exposure to crystalline silica can occur during common construction tasks working on concrete, brick, mortar, tiles, stone or other masonry.

If employees regularly dry cut, grind, crush, drill, or sweep material that contains crystalline silica without engineering controls, it is likely that the exposure standard will be exceeded.

However, if they only perform tasks that involve exposure to crystalline silica for a very short period of time over the day it is unlikely that the exposure standard will be exceeded (assuming no exposure for the remainder of the shift). An example is overhead drilling for a total of 15 minutes or less (Occupational Safety and Health Administration, 2017).

Air monitoring may be required if there is uncertainty on whether the exposure standard is being exceeded or there are concerns that engineering controls are not adequate.

Health monitoring

Health monitoring is required for employees who are exposed to silica dust (not taking into account any respiratory protection) at levels likely to exceed the Australian exposure standard.

Health monitoring must be performed under the supervision of a registered medical practitioner. Where health monitoring is required, it should be completed before job placement, and at least every 2 years.

RISKMANAGEMENT:

Control of risk

Where it is not reasonably practicable to eliminate a risk associated with a hazardous substance (eg crystalline silica dust), employers must reduce the risk in accordance with the hierarchy of control.

If engineering and other work practice controls are implemented and employee exposure is still likely to reach or exceed the exposure standard, then additional controls, such as respiratory protection, must be implemented to ensure employees' actual exposure does not exceed the standard.

SAFE WORK INSTRUCTION:

Engineering controls

On-tool dust extraction

This is a type of local exhaust ventilation (LEV) which is fitted directly onto the tool.

- One effective form involves a LEV 'system' consisting of several individual parts – the tool, captor hood, dust class M or H extraction unit and tubing.

- Integrated dust extraction devices are available for some hand-held tools. These self-contained units are fitted directly onto the tool where they automatically filter and collect dust. You should extract dust from the unit using a dust class M or H vacuum, or empty it directly into a waste bag in a way that does not generate dust when you dispose of it. Integrated dust extraction devices are only recommended for handheld drills with low air and dust volumes as they do not fall under dust class M or H.

Image 1: Overhead drilling with on-tool dust extraction.

Image 2: Concrete drilling using Hepa filtered vacuum extraction.

Image 3: Concrete grinding using Hepa filtered vacuum extraction.

On-tool water suppression

The tool is fitted with an integrated water delivery system that continuously supplies water. The resultant slurry should be cleaned up in a manner that does not generate dust.

Image 4: Concrete cutting and clean-up using on-tool water suppression, dust extraction, and vacuuming.

Isolation

Separate the employees from the dust source, by distance.

Administrative controls

Control exposure during clean up:

- Use a dust class M or H vacuum cleaner or wet methods to clean dusty floors or surfaces. Do not dry sweep or use compressed air.
- Launder dusty work clothes at the workplace to avoid taking them home. If you use a commercial laundry, dampen the clothes and place them in a sealed, labelled plastic bag. Inform the laundry that the clothes are contaminated with crystalline silica.

Training

Give employees appropriate information, instruction and training on:

- crystalline silica hazards and risks
- how to effectively use controls
- how to dispose of waste

Personal protective equipment (PPE)

Where engineering controls have been implemented so far as is reasonably practicable, respiratory protection can be effective in controlling exposure to crystalline silica. Ensure facial fit testing and a maintenance program is in place.

Half-face respirators should not be used by wearers with beards or even facial stubble.

Image 5: An appropriate combination of controls may including wet cutting, respiratory protection and hearing protection.

More Information

Master Builders Association South Australia

E: sqe@mbasa.com.au

T: (08) 211 7466