

SILICA

IN CONSTRUCTION

What is Silica?

Silica is Quartz

Quartz (silica) is found naturally in almost all rock, sand and soil.



It is also found in concrete products and bricks.



It is sometimes found in sandblasting (abrasive blasting) grit and is called "silica sand".



Silica Health Hazards

Inhaled silica dust scars the lungs

A lung disease called “**silicosis**” is caused by breathing of dust containing silica.

The dust causes “fibrosis” or scar tissue formation in the lungs. →

This reduces the lung’s ability to extract oxygen from the air.

There is no cure.



Silica Health Hazards

What are the symptoms of silicosis?

Early stages go unnoticed.

Continued exposure results in shortness of breath during exercise.

Prolonged high exposure can lead to extreme shortness of breath, chest pain, respiratory failure and death.



Silica Health Hazards

Other Health Effects

- Susceptibility to other lung diseases and infections such as tuberculosis.
- Acute silicosis may develop after very short periods of high exposure.
- Chronic silicosis develops after many years of lower levels of exposure.



Silica Exposure in Construction

Silica is found in many construction jobs



- Abrasive blasting (sand blasting)
- Concrete & masonry building construction
- Earthwork and rock crushing
- Masonry or concrete building demolition
- Road construction and repair

Silica Exposure - Sandblasting

Sandblasting with silica sand creates extremely high levels of silica dust.

Sandblasting on concrete with any kind of grit produces high levels of silica dust.

Sandblasting always requires the use of a respirator.



He needs an abrasive blasting respirator!

Silica Exposure in Construction

Concrete Work

Jack-hammering



Generates moderate to heavy amounts of dust



Power sanding



Generates heavy amounts of dust

Silica Exposure –Concrete Highway work

Drilling concrete pavement dry



Generates moderate amounts of dust

Silica Exposure – concrete cutting without water



Generates large amounts of dust

Silica Exposure – brick and cinder block cutting



Without water



With water

Generates moderate to heavy amounts of dust without water.

Silica Exposure - Tuckpointing



Generates heavy amounts of dust without water

Silica Exposure – cutting concrete siding with power saws

On some new construction, a lightweight concrete siding (hardiplank) is being used.

Cutting this siding with a power saw without water or ventilation can result in silica overexposure.



The Risk of Silica Exposure

- When dust is controlled, exposures are low.
- When dust is uncontrolled, exposures are high.
- Many exposures are for short time periods, but at very high concentrations.
- Short, high exposure can still exceed permissible limits and cause lung damage.

Silica dust exposure can be controlled by use of water or exhaust ventilation



Using water to cut concrete and bricks



Concrete sander with exhaust ventilation

Silica Exposure Control - Sandblasting

The best control is to not use silica sand.

Substitutes include garnet, glass beads, aluminum oxide, or iron oxide.

If silica sand is used, keep other workers away from area.

If workers must be in the area, they will need to wear respirators too.



Silica Exposure Control

Avoid dry sweeping and use of compressed air on concrete



Both these activities can stir up large amounts of dust.
Use a vacuum with high efficiency filters when possible.

Silica and Use of Respirators

Respirators must be used if silica dust can't be controlled with water or ventilation

either



**Air-purifying respirator
with dust cartridge**

or



Supplied air respirator

Sandblasting Respirators (Abrasive blasting hoods)

Sandblasting with silica sand requires a full sandblasting hood.

The sandblaster helper will also need a respirator. Nearby employees may need respirators, also.





Washington State Department of
Labor & Industries

Silica in Construction

Any Questions ?

Silica in Construction Quiz

Question 1

Where is silica found?

- a) In polluted air in big cities.
- b) In concrete, bricks and sand.
- c) In certain chemicals.

Silica in Construction Quiz

Question 2

Why is dust containing silica so dangerous?

- a) Because it can cause permanent damage to the lungs.
- b) It can make it hard to see.
- c) It can get in your eyes and damage them.