

What are the possible exposure sources?

Crystalline silica can be found in certain types of natural materials, such as:

- Sand
- Soil and rock
- Gravel
- Sandstone
- Slate
- Granite
- Clay

Typical construction materials made from these natural ingredients include:

- ✔ Ceramic and terracotta tiles
- ✔ Concrete and concrete block
- ✔ Manufactured stone
- ✔ Roof tiles
- ✔ Bricks and blocks
- ✔ Grouts and mortar
- ✔ Some joint compounds
- ✔ Abrasive materials

These become some of the sources of exposure associated with a number of the construction trades.

Exposure Levels

Airborne exposure to crystalline silica dust can depend on a number of things, such as:

1. Types of activities

- **Cutting, drilling and coring**
 - Concrete
 - Roof tile
 - Tile backer board
 - Brick and block
 - Granite



- **Grinding, Sanding and Sandblasting**

- Sack and patch
- Tuck point grinding
- Scabbling/scarifying
- Drywall mud sanding
- Hand-held surface grinding



- **Pulverizing**

- Jack and chipping hammers
- Cement truck cleaning
- Concrete recycling
- Road milling
- Backhoes, excavators
- Demolition

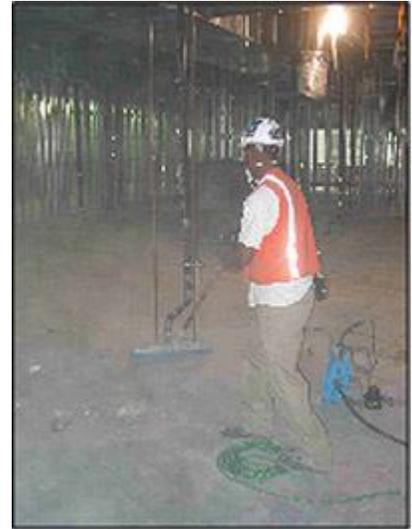


- **Mixing (dry)**

- Cement
- Plaster and grout



- **Cleaning up**
 - Dry sweeping (versus wet)
 - Compressed air (versus vacuum)
 - Hauling



2. Location

- Outside or in a wide open area versus inside or an enclosed area

3. Materials being used

- The percentage of silica present varies a lot. The higher the content, the more likely overexposure will occur

4. Types of equipment used

- Cutting using wet methods versus dry methods
- Types of blades or abrasives used
- Use of local ventilation that prevents or reduces the amount of dust you breathe

5. How long the dust-generating activity goes on in a shift

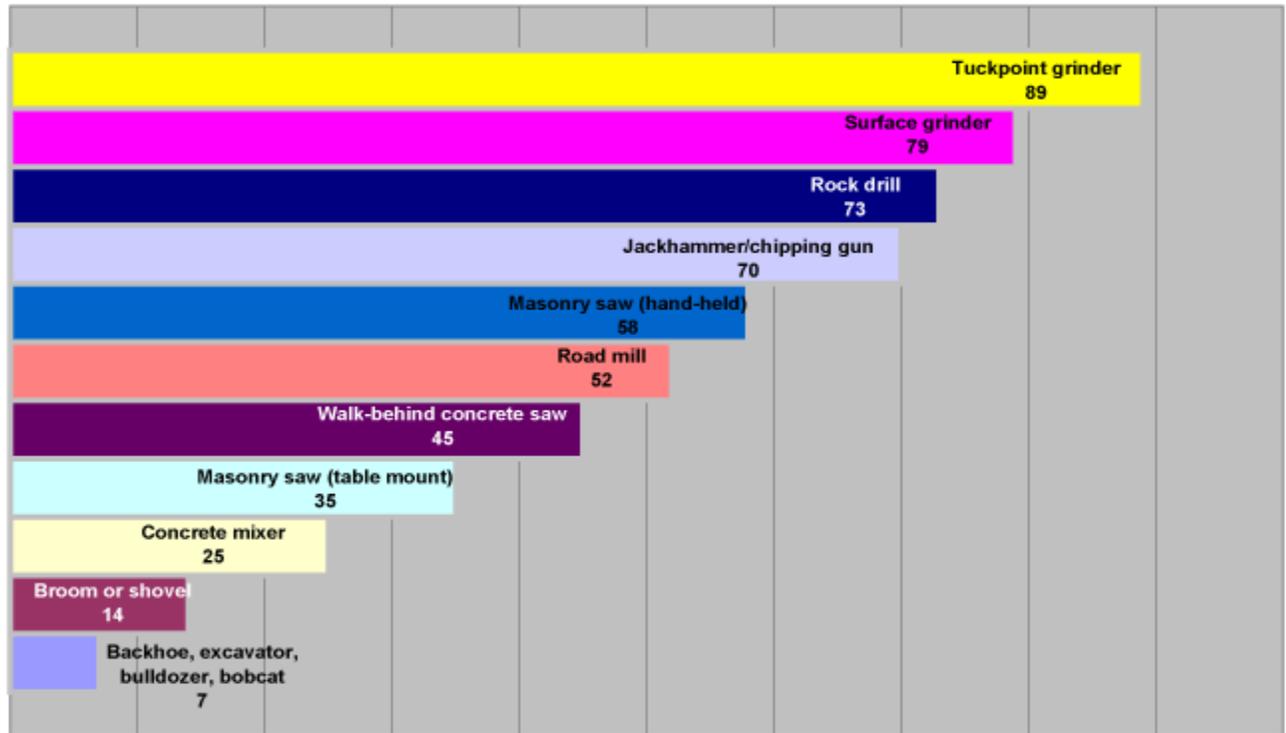
- The longer the duration of exposure, the greater the chance of overexposure

6. Weather conditions

- Presence of moisture
- The lighter the wind the less likely airborne dust generated will move away from the breathing zone and be quickly diluted. On the flip side, wind currents can move the hazard away from one person to another.

Sources of Exposure Information

What are your chances of being overexposed?
(Based on a Summary of University of Washington Studies)



The probability (in %) of being overexposed
(based on the Cal/OSHA PEL of 0.1 mg/m³ of air for respirable quartz silica)

Allowable Exposure Levels

Cal/OSHA has established regulatory permissible exposure levels for silica that varies depending on the form of silica (quartz, fused, tripoli, tridymite and cristobolite) and particle sizes present. These allowable exposure levels are reflective of an employee's average exposure throughout an 8-hour shift. There is a difference between "total" and "respirable" silica dust, in that "respirable" silica dust is more likely to get into the deep parts of the lungs and cause more serious damage.

- Cal/OSHA's Permissible Exposure Levels over an 8-hour average basis
 - Respirable crystalline silica (quartz, fused, tripoli), 0.1 mg/m³ - 0.1 milligrams of Silica in 1 cubic meter of air.
 - Total crystalline silica (quartz), 0.3 mg/m³.
 - Respirable cristobolite and tridymite, 0.05 mg/m³.

NOTE: Special exposure sampling methods are needed to collect the “respirable” fraction of the dust you are exposed to. If not done properly, this type of sampling can easily be inaccurate and give you misleading results.

It’s important to note that there are other exposure guidelines from NIOSH (National Institute of Occupational Safety and Health) and ACGIH (American Conference of Industrial Hygienists). Although not enforceable by Cal/OSHA, you should still take them into consideration.

- NIOSH recommends an exposure level of 0.05 mg/m³ on an 8-hour average basis
- ACGIH recommends an exposure level of 0.025 mg/m³ on an 8-hour average basis.
 - ACGIH currently lists crystalline silica as a known human carcinogen.
- Crystalline silica is currently on the California Prop 65 List of substances known to the State of California to cause cancer

Additional Sources of Exposure Information:

- University of Washington: www.depts.washington.edu/silica/dust.html
- NIOSH: www.cdc.gov/niosh/topics/silica/
- eLCOSH: www.cdc.gov/elcosh/docs/hazard/chemical_silica.html
- Health and Safety Executive (UK): www.hse.gov.uk/pubns/cis36.pdf