Workplace injury prevention

Silica hazards

What is silica and why is it dangerous?

Silica is a naturally occurring mineral commonly found in materials like sand, rock, concrete and ceramics. Crystalline silica exists in three main forms: quartz, cristobalite and tridymite. Inhaling fine or respirable dust particles of crystalline silica can pose serious health risks. Prolonged exposure during activities like cutting or grinding materials containing silica has been linked to various lung diseases including silicosis, lung cancer, chronic obstructive pulmonary disease (COPD) and rheumatoid arthritis.

Where is this hazard found?

Exposure to crystalline silica is a common hazard in tasks and industries where materials containing silica are manipulated or processed.

Industry	Tasks	Materials
Construction	Cutting, sawing, grinding, drilling or crushing.	Concrete, mortar, brick, asphalt, stone and various construction materials.
Mining and quarrying	Extraction and processing of minerals. Mining processes such as drilling, cutting, crushing or blasting. Disturbance of soil and clay.	Sandstone, granite, slate, soil, clay and other mineral ores.
Manufacturing	Production of glass, ceramics, pottery and various metal casting processes.	Sand, clay and other silica-containing raw materials.
Railroad and road construction	Activities involving ballast and track materials.	Ballast containing silica
Energy	Hydraulic fracturing (fracking), drilling operations, construction operations, refractory brick operations.	Proppants (sand) used in fracking, drilling fluid additives, concrete, mortar, brick, asphalt, stone and various construction materials.
Agriculture	Handling and spreading certain fertilizers and pesticides and soil and clay disturbance activities.	Some fertilizers and pesticides contain silica and soil and clay.

Abrasive blasting	Sandblasting surfaces for cleaning or preparation.	Sand used as an abrasive blasting medium.
Foundry work	Casting and molding of metals.	Sand molds used in metal casting processes.
Dental laboratories	Grinding or shaping dental appliances.	Silica-containing materials used in dental work.
Transportation and storage	Truck, rail and other vehicle loading and unloading operations in support of transportation.	Cement, sand, gravel, various construction materials and dry products that contain silica.

Workers in these industries must be aware of the silica hazard and take appropriate protective measures, including the use of personal protective equipment (PPE) and strict adherence to safety guidelines and regulations.

How do you protect yourself from this hazard?

To protect against crystalline silica exposure, individuals should adhere to safety guidelines and implement key measures:

- Engineering controls, like local exhaust ventilation systems, help capture and control dust at its source.
- Substitute other materials, where possible, that reduce the risk of silica exposure.
- Wet methods, such as wet cutting or drilling, suppress dust and prevent airborne dispersion.
- Isolate processes generating silica dust from other workers to minimize exposure.
- Wear PPE appropriate for the hazard, especially in situations with airborne silica dust.
- Comprehensive training on silica hazards, proper work practices and awareness of this hazard is essential.
- Encourage good personal hygiene.
- Adherence to regulatory standards.
- Regular equipment maintenance and medical surveillance (at least every two years).

What is the occupational limit and what method should be used to test?

Most silica-related occupational cancers in Saskatchewan occur among workers in the construction, manufacturing and mining sectors within the province. Occupational exposure limits for silica vary across provinces. In Saskatchewan, the current occupational exposure limit is 0.05 milligrams per cubic metre (mg/cu.m), time-weighted average over an eight-hour period.

Measure silica exposure levels by collecting personal air samples using published methods such as National Institute for Occupational Safety and Health (NIOSH) 75002. Testing should be conducted by a qualified person (at least every two years), such as an industrial hygienist and processed in a NIOSH 7500 accredited lab. If personal sampling is conducted, the results must be communicated to the individual who was sampled.

If a silica exposure is greater than the occupational limit for a particular task or area in a workplace, all impacted personnel (those that could be exposed to the hazard) must be informed under provincial occupational health and safety (OHS) legislation (right to know).

What are the relevant legislative references in Saskatchewan?

Under *The Saskatchewan Employment Act, 2013* (the Act) and *The Occupational Health and Safety Regulations, 2020* (the Regulations), these sections are important to understand with regards to silica exposure in the workplace:

- The Act, Section 3.16(1), *Duty to provide information*
- The Regulations, Part 21, *Chemical and Biological Substances*
- The Regulations, Part 24, *Silica Processes and Abrasive Blasting*
- The Regulations, Table 6, *Notable Medical Conditions Resulting from Occupational Exposure*
- The Regulations, Table 17, *Designated Chemical Substances*
- The Regulations, Table 18, *Contamination Limits*

References

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