

SILICA

- ▶ is one of the most common hazards on a worksite,
- ▶ damages the lungs and causes scar tissue to form, causing the lung tissue to become thicker
- ▶ can cause irreversible lung damage and lead to diseases including cancer if inhaled,
- ▶ control methods can reduce exposure and management risk

Silica is found in many naturally occurring materials and industrial processes.

ACCORDING TO CAREX CANADA,
429,000
CANADIAN WORKERS ARE EXPOSED TO
SILICA IN THEIR WORKPLACES.

Who is affected?

The largest occupational groups affected by silica exposure are :


CONSTRUCTION


MINING


OIL AND GAS


MANUFACTURING



AGRICULTURE


Where is silica found?

Silica is the basic component in sand and rock. It is also found in a wide range of construction materials, such as:



BRICKS


GRAVEL/STONE/
ASPHALT


CONCRETE/
CEMENT



MORTAR


GLASS


SOME TYPES OF
FIBREGLASS


ARTIFICIAL
STONE
(e.g. countertops)


SOME
ABRASIVES/
CLEANSERS


GRANITE



SAND/
FILL DIRT/
TOPSOIL



CERAMICS



FILLERS

What are the health effects and diseases related to silica exposure?

Workers may experience symptoms such as:


SHORTNESS OF
BREATH


SEVERE
COUGHING


BODY
WEAKNESS

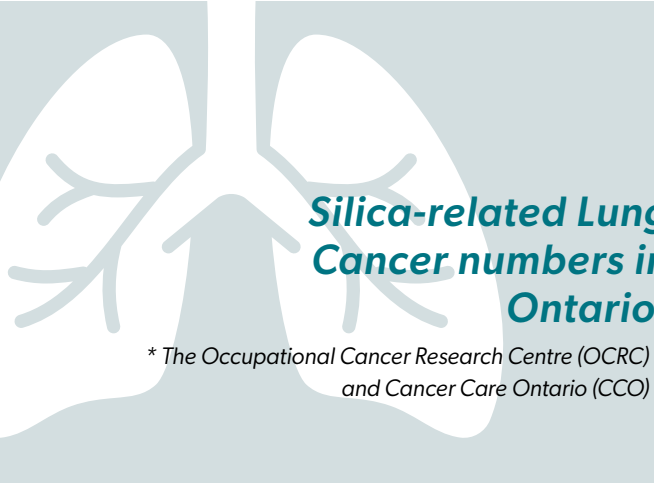
More diseases caused by silica exposure include:


CHRONIC
KIDNEY DISEASE


RHEUMATOID
ARTHRITIS


SCLERODERMA

Both **short-term high exposures** or **long-term repeated exposures** can cause Silica-related diseases:



Silica-related Lung Cancer numbers in Ontario:

* The Occupational Cancer Research Centre (OCRC) and Cancer Care Ontario (CCO)

Lung Cancer

Silica Exposure Can Cause Lung Cancer

2.5%
(estimated) of lung cancer cases diagnosed per year are thought to be caused by silica*

▶ That is approximately **200** lung cancer cases per year

Silicosis

Inhaling silica dust can also cause silicosis, a serious and irreversible lung disease.


- ▶ It is possible to have silicosis without showing any symptoms at first.
- ▶ As the disease progresses workers may show noticeable symptoms such as:
 - Shortness of breath
 - Severe coughing
 - Body weakness


▶ **Continued exposure to silica can worsen disease progression.**


What activities are associated with silica exposure?


- ▶ Silica becomes hazardous when it is broken into fine particles and inhaled.
- ▶ These fine silica dusts are known as Respirable Crystalline Silica (RCS).
- ▶ RCS is much smaller than ordinary sand and is small enough to penetrate into the gas-exchange region of the lungs (alveoli).


RCS is made when materials that contain silica (like concrete and bricks) go through processes such as:



SAWING/
CUTTING



DRILLING



CRUSHING



CHIPPING



BLASTING



EARTH
MOVING

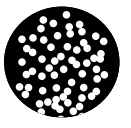

GRINDING/
SANDING /
DRESSING


LOADING /
HAULING /
DUMPING

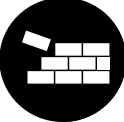

DEMOLISHING
RENOVATING


SWEEPING /
BLOWING


TUNNELING /
EXCAVATING

or when the process involves silica being applied, such as:

ABRASIVE/
SAND
BLASTING

Industrial processes that can generate silica:




MANUFACTURING BRICKS



CERAMICS




CONCRETE BLOCKS



STONES



FOUNDRY WORK



HYDRAULIC FRACTURING



SOME DENTAL PROCESSES



ARTIFICIAL COUNTERTOPS

Prevention

What can be done at my workplace to prevent silica exposure?

The best way to reduce the risk of exposure to silica dust is to **eliminate the source of exposure**.
If that's not possible, there are other risk controls to use. If working in an industry or occupation where respirable crystalline silica can be generated, control measures may be needed, such as:



ENGINEERING CONTROLS




ADMINISTRATIVE CONTROLS




PERSONAL PROTECTIVE EQUIPMENT (PPE)


These controls serve to:



PREVENT SILICA DUST FROM GETTING IN THE AIR

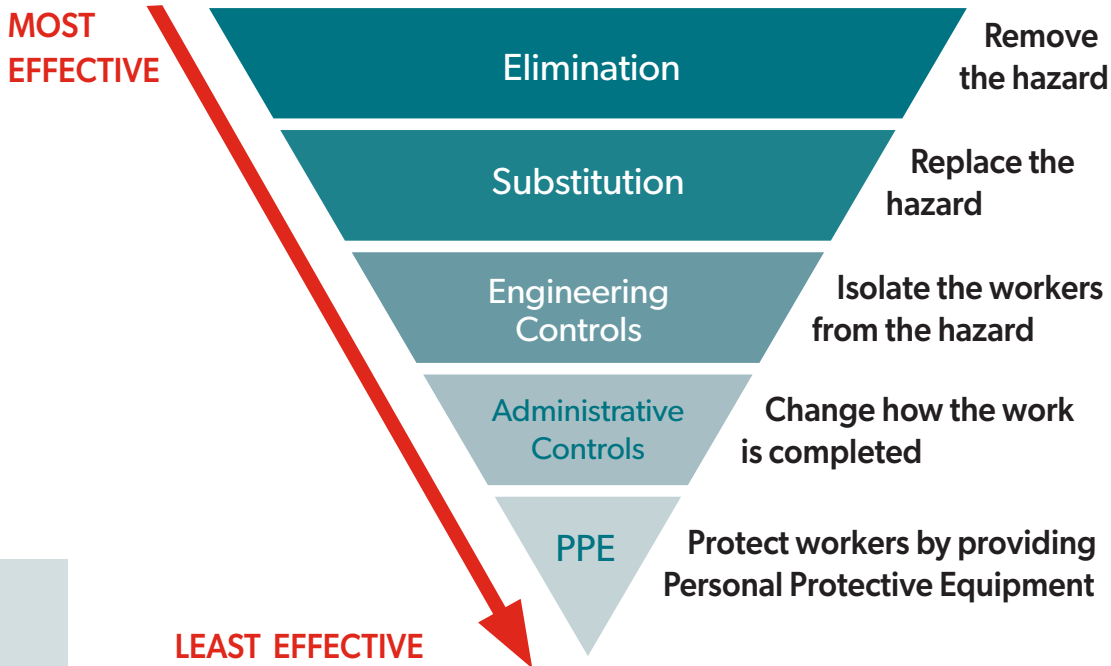


REMOVE EXISTING SILICA DUST FROM THE AIR



REDUCE THE LIKELIHOOD OF WORKERS INHALING SILICA DUST

Hierarchy Of Control



- 1 **Elimination**

Change the work process to avoiding cutting, grinding, or drilling, etc. (e.g. improving concrete forms). This is the most effective control method, and can be achieved by:

 - ▶ Using a process that generates less dust (for example, splitting rather than sawing concrete pavers)
 - ▶ Designing formwork that reduces the amount of concrete finishing required.
- 2 **Substitution**

Source and substitute a safer, less hazardous material (i.e. lower silica-containing products). For example:

 - ▶ Using garnet instead of silica in sand-blasting operations.
- 3 **Engineering Controls**

Make physical modifications to facilities, equipment, and processes such as:

 - ▶ Enclosing the process,
 - ▶ Using a wet process, or
 - ▶ Using local exhaust ventilation to reduce exposure.

- 4 **Administrative Controls**

Adopt work practices and policies that limit the risk of silica dust exposure. Provide workers with awareness tools and training in proper clean-up and procedures for safe work. Instigate change by:

 - ▶ Developing a written exposure control plan for silica
 - ▶ Posting warning signs and information sheets in the work area
 - ▶ Scheduling crews to work as far away from silica dust-generating processes as possible
 - ▶ Providing adequate washing facilities on site
 - ▶ Developing safe work procedures for dealing with silica dust
 - ▶ Monitoring worker exposure to silica.

- 5 **Personal Protective Equipment (PPE)**

Provide workers with eye protection and protective clothing as well as proper respirators:

 - ▶ half-face with P100 filters,
 - ▶ full-face with P100 filters,
 - ▶ or a full-face with a powered air-purifying respirator and P100 filter can all help reduce exposure.

Be sure to test all personal protective equipment to ensure it is working properly. Remember, **PPE is the least effective control**, and must be used with at least one other control in place.

Learn more about silica at:
www.ohcow.on.ca/occupational-illness/exposures/silica/
www.preventoccdisease.ca

Take Action • Reduce Risk • Protect Workers



FREE FOR ALL REGISTERED ONTARIO CONSTRUCTION WORKERS



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