

Working Safely with Silica—Know the hazard, Control the dust

What is Silica?

Silica, often referred to as quartz, is a very common mineral. It is found in many materials common on construction sites, including soil, sand, concrete, masonry, rock, granite, and landscaping materials.

The dust created by cutting, grinding, drilling or otherwise disturbing these materials can contain crystalline silica particles. These dust particles are very small. You cannot see them. This respirable silica dust causes lung disease and lung cancer. It only takes a very small amount of airborne silica dust to create a health hazard.

Silica exposure remains a serious threat to nearly 2 million U.S. workers, including more than 100,000 workers in high risk jobs such as abrasive blasting, foundry work, stonecutting, rock drilling, quarry work and tunneling. Crystalline silica has been classified as a human lung carcinogen. Additionally, breathing crystalline silica dust can cause **silicosis**, which in severe cases can be disabling, or even fatal. The respirable silica dust enters the lungs and causes the formation of scar tissues, thus reducing the lungs' ability to take in oxygen. There is no cure for silicosis. Since silicosis affects lung function, it makes one more susceptible to lung infections like **tuberculosis**. In addition, smoking causes lung damage and adds to the damage caused by breathing silica dust.

The Hazard:

Breathing too much dust containing the crystalline forms of silica particles small enough to enter the deep parts of the lung can cause "silicosis", which is a scarring of the lung tissues, cancer and other forms of lung disease, including an increased risk of getting tuberculosis. It usually takes several years before you know that you have a problem. Higher exposures can produce health problems much sooner. At first, there can be no symptoms of disease, and then shortness of breath, fatigue, severe cough and chest pain can develop later on. Short of a lung transplant, silicosis can not be reversed, so best to minimize exposures now to prevent disability later in life.

The Types of Operations:

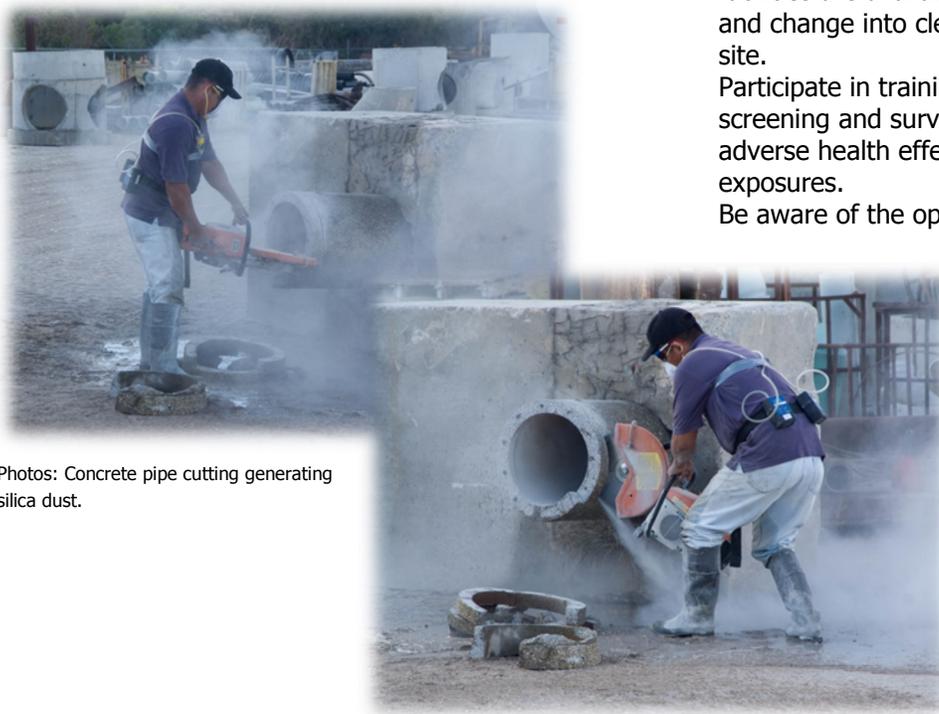
The most severe exposures to crystalline silica result from abrasive blasting, which is done to clean and smooth irregularities from molds, jewelry, and foundry castings, finish tombstones, etch or frost glass, or remove paint, oils, rust, or dirt from objects needing to be repainted or treated. Other exposures to silica dust occur in cement and brick manufacturing, asphalt paving manufacturing, china and ceramic manufacturing, and the tool and die, steel and foundry industries. Crystalline silica is used in manufacturing, household abrasives, adhesives, paints, soaps, and glass. Additionally, crystalline silica exposures occur in the maintenance, repair and replacement of refractory brick furnace linings.

The following are some examples of work operations that can produce excessive exposure levels, such as dry grinding on granite counter tops.

- Tuck point grinding
- Surface grinder
- Rock drill
- Broom or shovel
- Jackhammer / chipping gun
- Hand-held masonry saw
- Road mill
- Backhoe, excavator, bulldozer
- Walk-behind concrete saw
- Mixing concrete, grout, etc
- Bobcat

Best Practices:

- ◆ Minimize dust getting into the air you breath:
 - ◇ Use equipment designed to cut, saw and grind wet or use ventilation that captures the dust as it is created.
 - Proper use and preventative maintenance is critical.
- ◆ Don't smoke tobacco products.
- ◆ Never use compressed air to clean dust off equipment, surfaces or your clothes. Where safely feasible, use water or a HEPA vacuum. Consider using disposable clothing that stays at the work site.
- ◆ Minimize dust generation when working with or around silica-containing materials.
- ◆ Handle and dispose of waste materials without generating airborne dust.
 - ◇ Use a HEPA vacuum, squeegee instead of broom, or sweeping compound, in that order.



Photos: Concrete pipe cutting generating silica dust.

What can employers/employees do to protect themselves against exposures to crystalline silica?

Replace crystalline silica materials with safer substitutes, whenever possible.

Provide engineering or administrative controls, where feasible, such as local exhaust ventilation, and blasting cabinets. Where necessary to reduce exposures below the PEL, use protective equipment or other protective measures.

Use all available work practices to control dust exposures, such as water sprays.

Wear only a N95 NIOSH-certified respirator, if respirator protection is required. Do not alter the respirator. Do not wear a tight-fitting respirator with a beard or mustache that prevents a good seal between the respirator and the face.

Wear only a Type CE abrasive-blast supplied-air respirator for abrasive blasting.

Wear disposable or washable work clothes and shower if facilities are available. Vacuum the dust from your clothes and change into clean clothing before leaving the work site.

Participate in training, exposure monitoring, and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposures.

Be aware of the operations and the job tasks creating crystalline silica exposures in your workplace environment and know how to protect yourself.

Be aware of the health hazards related to exposures to crystalline silica. Smoking adds to the lung damage caused by silica exposures. Do not eat, drink, smoke, or apply cosmetics in areas where crystalline silica dust is present. Wash your hands and face outside of dusty areas before performing any of these activities.

Remember: If it's silica, it's not just dust.



SafetyFlorida
Consultation Program



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