



# Dry Cutting & Grinding is **RISKY BUSINESS**

**T**hat cloud of dust you see when a worker cuts or grinds concrete, brick, or stone is not just harmless dust... It contains crystalline silica... and IT CAN KILL.

Most crystalline silica is in the form of quartz. Common sand is almost 100% quartz. Fine particles created by cutting and grinding can get deep into the lungs. Most concrete and masonry products contain large amounts of sand.

When you inhale the dust, silica particles scar your lungs, causing a disabling, irreversible, and incurable lung disease called silicosis. The good news is that silicosis is 100% preventable. You can work with silica-containing materials in ways that do not result in exposure to dust.

## FACTS

- New Jersey law (N.J.S.A. 34:5-182) prohibits dry cutting and dry grinding of masonry materials.
- Hundreds of workers die of silicosis each year in the U.S. and hundreds more become disabled and are unable to take care of themselves and their families.
- Since 1968, more than 14,000 workers in the U.S. have died from silicosis.
- More than one million U.S. workers are at risk of developing silicosis.
- The construction industry has one of the highest numbers of deaths due to silicosis.

### Some silica-containing materials

- asphalt
- block
- brick
- ceramic tile
- concrete
- granite
- grout
- joint compound
- mortar
- pavers
- roof tiles
- sand
- slate
- some siding
- terrazzo

### Types of operations that may result in exposure to silica dust

- 
- sawing
  - drilling
  - chipping
  - clean-up
  - tuck pointing
  - scarifying
  - milling
  - grinding
  - polishing
  - crushing
  - needle gunning



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## Types of silicosis and related symptoms



There are three types of silicosis:

- **Acute silicosis:** Can occur after only weeks or months of exposure to very high levels of crystalline silica. Death can occur within months.
- **Accelerated silicosis:** Results from exposure to high levels of crystalline silica and occurs 5 to 10 years after exposure.
- **Chronic silicosis:** Usually occurs after 10 or more years of exposure to crystalline silica at low levels. This is the most common type of silicosis.

### Symptoms of Silicosis

Silicosis begins with few, if any, symptoms. Once present, these symptoms can include shortness of breath, severe cough, wheezing, and chest tightness.

Breathing dust containing crystalline silica has also been linked to other diseases such as tuberculosis, kidney disease, and lung cancer. Symptoms can include fever, weight loss, and night sweats. These symptoms can become worse over time, leading to death.

New Jersey law requires that doctors and advanced practice nurses report cases of silicosis to the New Jersey Department of Health and Senior Services (NJDHSS).

## How to prevent silica exposure



The key to preventing silicosis is to keep dust out of the air. Dust controls can be as simple as a water hose to wet the dust before it becomes airborne (see back page for tips). Employers and employees should use the following methods to control respirable crystalline silica dust:



Dust containing silica can be generated when cutting granite, a popular building material used for kitchen and bathroom countertops, and other applications. Granite can contain up to 70% silica.

- △ Recognize when silica dust may be generated and plan ahead to eliminate or control the dust at the source.
- △ Provide workers with training that includes information about health effects, work practices, and protective equipment for respirable crystalline silica.
- △ Use engineering controls such as local exhaust ventilation (with dust collectors) or wet methods to prevent the release of dust into the air.
- △ Routinely maintain dust control systems to keep them in good working order.
- △ Do not cause dust to become airborne during clean-up. Remove dust from equipment with a water hose or wet-wiping rather than with compressed air. Use vacuums with high-efficiency particulate air (HEPA) filters, or use wet sweeping instead of dry sweeping.

- △ Minimize exposures to nearby workers by using good work practices, such as marking and posting the boundaries of work areas where exposure to airborne dust can occur.
- △ Wear disposable or washable protective clothes at the worksite.
- △ Shower if possible and change into clean clothes before leaving the worksite to prevent contamination of cars, homes, and other work areas.
- △ Conduct air monitoring to measure worker exposures and ensure that controls are providing adequate protection for workers.
- △ Provide annual medical examinations for all workers who may be exposed to respirable crystalline silica.
- △ Use proper respiratory protection when engineering controls cannot keep silica exposures below the NIOSH\* Recommended Exposure Limit (REL). Respirators should not be the primary method of protection. If engineering controls cannot keep dust levels below the NIOSH REL, then respirators should be used.

\*NIOSH (National Institute for Occupational Safety and Health) - NIOSH REL is 0.05 mg/m<sup>3</sup> as a 10-hour time-weighted average.



This laborer using a demo saw without water was found to be exposed to a respirable silica dust level that was more than 45 times the NIOSH REL, after being monitored for only half of a work shift. Note that other workers are also being exposed.

## Choosing the right respirator



### RESPIRATORY PROTECTION PROGRAM

When respirators are used, the employer must establish a comprehensive respiratory protection program as required by the OSHA Respiratory Protection Standard, and outlined in the NIOSH *Guide to Industrial Respiratory Protection*.

A respiratory protection program must cover the following basic elements, as applicable:

- Periodic environmental monitoring;
- Regular training of personnel regarding exposure and respirator use;
- Selection of appropriate NIOSH-approved respirators;
- A medical evaluation of the worker's ability to perform the work while wearing a respirator;
- Respirator fit testing (annually);
- Maintenance, inspection, cleaning, and storage of respiratory protection equipment; and
- Procedures for regularly evaluating the effectiveness of the program.

New Jersey law (N.J.S.A. 34:5-182) requires that employers provide workers with full-face air-purifying respirators when engineering controls cannot be used. Use of respirators should be part of a complete respiratory protection program.

Air sampling is necessary to verify dust levels. NIOSH recommendations for respiratory protection for crystalline silica (as respirable dust) concentrations in air are as follows:

- **Up to 0.5 mg/m<sup>3</sup>\*\***  
Half-mask air-purifying respirator with, at a minimum, N-95 filters.
- **Up to 1.25 mg/m<sup>3</sup>**  
Powered air-purifying respirator with, at a minimum, N-95 filters; or supplied-air respirator with hood or helmet operated in a continuous-flow mode.
- **Up to 2.5 mg/m<sup>3</sup>**  
Full-facepiece air-purifying respirator with, at a minimum, N-100 filters; or powered air-purifying respirator with tight-fitting facepiece and high-efficiency filters.
- **Up to 25 mg/m<sup>3</sup>**  
Positive pressure supplied-air respirator.
- **Sandblasting (without cabinet and dust collector)**  
Type CE abrasive-blasting respirator.

\*\* Note: Although acceptable by NIOSH, an N-95 filtering facepiece (disposable respirator) provides minimum protection. NJDHSS recommends that the tight-fitting half-mask air-purifying respirator be used.

## Tips for controlling dust



- Use the dust collection systems available for many types of dust-generating equipment. When purchasing equipment, look for dust controls.
- Use local exhaust ventilation to prevent dust from being released into the air. Always use the dust control system, and keep it well maintained.
- Do not use equipment if the dust control system is not working properly.
- Use equipment that provides water to the blade or grinder when sawing or grinding concrete or masonry. Be sure to only use blades and abrasive wheels that are rated as safe for use with water.
- Keep in mind that dust levels can remain high for some time even after cutting, grinding, or sweeping has stopped.



Construction worker cutting silica-containing ceramic tile with a “wet saw.”

## How to get help



### About health problems:

If you think you have been exposed to silica dust or begin to notice symptoms such as cough and shortness of breath, you should go to your doctor and explain your work history.

### About the information presented in this fact sheet:

Contact the NJDHSS, Occupational Health Surveillance Program:

**Phone:** 609-984-1863 or 800-772-0062

**E-mail:** [surveillance@doh.state.nj.us](mailto:surveillance@doh.state.nj.us)

**Web site:** [www.nj.gov/health/eoh/survweb](http://www.nj.gov/health/eoh/survweb)

**Address:** NJ Dept. of Health & Senior Services  
Occupational Health Surveillance Program  
Health & Agriculture Building, Rm 701  
PO Box 360  
Trenton NJ 08625-0360

### About the New Jersey dry cutting law (N.J.S.A. 34:5-182):

Contact the New Jersey Department of Labor and Workforce Development, Public Safety and Occupational Safety and Health Safety Compliance Unit, 609-292-2425.