



HEALTH ALERT

Silica Exposure in Construction Workers



Hundreds of workers with silicosis die each year in the U.S. and hundreds more become disabled and are unable to take care of themselves or their families. Since 1968, more than 14,000 workers in the U.S. have died from silicosis and more than one million workers are at risk of developing silicosis.

The construction industry has one of the highest numbers of deaths due to silicosis. When workers inhale silica dust deep into the lungs, silica particles scar lungs, causing a disabling, irreversible, and incurable lung disease called silicosis.

Silicosis is 100% preventable and there are a variety of things that employers and workers can do to reduce the risks of silicosis. Employers need to train their workers about the health effects, work practices, and protective equipment available to prevent exposure to crystalline silica dust.

What is crystalline silica?

Crystalline silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two other forms of crystalline silica. Each type of crystalline silica may become respirable size particles when workers chip, cut, drill, or grind objects that contain crystalline silica.

What are some common types of silica-containing materials?

Some of the most common silica-containing materials include concrete, granite, asphalt, block, brick, ceramic tile, grout, joint compound, mortar, pavers, roof tiles, sand, slate, some siding and terrazzo.



Photo Credit: NJ Department of Health and Senior Services

What are some common operations that may result in exposure to silica dust?

Potential work exposures to airborne crystalline silica include dry cutting, grinding, abrasive blasting, rock cutting, chipping, drilling, jack hammering, and demolition of concrete and masonry structures.

What are the symptoms of silicosis?

Initially, there are few if any symptoms at all. Worker's may experience shortness of breath upon exercising and have clinical signs of poor oxygen/carbon dioxide exchange. As the disease progresses, a worker may experience weakness/fatigue, severe shortness of breath, severe cough, wheezing, chest pain/tightness, weight loss, or respiratory failure.

If these or other respiratory symptoms occur, you should seek the care of a physician.

How can silica exposure be prevented?

- ✓ **Never dry cut or grind concrete, granite or other silica-containing materials.** Use all available work practices to control dust exposures and routinely maintain dust control systems to keep them in good working order.
- ✓ Provide engineering or administrative controls, such as local exhaust ventilation (with dust collectors), blasting cabinets or wet methods to prevent the release of dust into the air.
- ✓ Be aware of the operations and job tasks creating respirable dust particles in your workplace and know how to protect yourself.
- ✓ Wear disposable or washable protective clothes at the worksite.
- ✓ 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.
- ✓ Participate in training, exposure monitoring, and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposures.
- ✓ Use proper respiratory protection when engineering controls cannot keep silica exposures below the National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit.

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How to choose the right respirator to prevent silica exposure?

Developing and maintaining a comprehensive respiratory protection program is a critical component in controlling silica hazards in the workplace and required prior to the use of respirators in the workplace.

Components of a comprehensive respiratory protection program include:

- Selection of appropriate NIOSH-approved respirators (N95 or greater)
- Regular training of personnel regarding silica exposures and appropriate use of respirators
- Medical evaluation of workers' ability to safely use respiratory protection
- Annual respirator fit testing
- Appropriate inspection, cleaning, storage, and maintenance of respirators
- Environmental monitoring procedures
- Evaluation of the program's effectiveness on a regular basis

NIOSH recommends the use of half-facepiece particulate respirators with N95 or better filters for airborne exposures to crystalline silica at concentrations less than or equal to 0.5 mg/m³. NIOSH recommends higher levels of respiratory protection at silica concentrations greater than 0.5 mg/m³.

Additional Resources:

U.S. Department of Labor Occupational Safety & Health Administration (OSHA)

<http://www.osha.gov>

National Institute for Occupational Safety and Health (NIOSH)

<http://www.cdc.gov/niosh/topics/silica/> & <http://www.cdc.gov/eid/content/16/2/pdfs/09-0824.pdf>

Health and Safety Executive (HSE)

<http://www.hse.gov.uk/pubns/>

Office of Health, Safety and Security (HSS)

<http://hss.energy.gov/index.html>

New Jersey Department of Health and Senior Services

<http://www.state.nj.us/health/>

References:

1. Bang K. et al. "National Trends in Silicosis Mortality in the United States, 1981 - 2004". American Journal of Industrial Medicine 51:633-639 (2008).

Information contained within this fact sheet was extracted in part from the U.S. Department of Labor Occupational Safety & Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and the New Jersey Department of Health and Senior Services.