

Silica Exposure of Metal and Nonmetal Miners



Health Hazard Information Card HH-6

What is silica?

Silica is an abundant mineral found in sand, gravel, rock, and ores. MSHA is concerned with respirable crystalline silica – microscopic particles that can penetrate deep into the lungs. There are three primary forms of crystalline silica: quartz, cristobalite, and tridymite. Quartz is the most common, but cristobalite and tridymite are more toxic.

Overexposure to dust that contains microscopic particles of crystalline silica can cause scar tissue to form in the lungs, making it harder to breathe. Even if exposure stops, silicosis can continue to develop.

Jobs with the greatest risk of overexposure are:

- » **Underground mining:** loader operator, crusher operator, driller
- » **Surface mining:** driller, cleanup worker, laborer, bagger, crusher operator
- » **Milling:** bagger and packer, laborer, cleanup worker

There is no cure for silicosis; prevention is the only answer.

Crystalline silica is classified as a carcinogen by the International Agency for Research on Cancer (IARC). Overexposures are also linked to effects on other internal organs besides the lungs.

What are the symptoms of silicosis?

Early stages often go undetected. As silicosis progresses, the miner may experience shortness of breath, severe cough, fatigue, loss of appetite, chest pains, and fever. Silicosis can also result in death. Acute silicosis can develop after short periods of intense overexposure. Chronic silicosis usually occurs after 10 or more years of overexposure.

What does MSHA require to protect miners?

MSHA requires that respirable crystalline silica in metal and nonmetal mines be kept at or below MSHA's exposure limits. A specific rule protects drillers from overexposure: holes must be collared and drilled wet or other effective controls must be used.

How can miners limit silica exposures?

Mine operators must provide and ensure the maintenance and use of appropriate engineering controls to limit dust exposures. Miners should use and maintain all available controls. Respirators are not meant to be the primary control for silica dust, but may be necessary while engineering controls are being installed, replaced, or repaired. The respirator must be approved for dust, correctly used and maintained, cartridges checked or changed every shift, and fitted to ensure a tight face-to-facepiece seal.

How can miners determine if they have silicosis?

The National Institute for Occupational Safety and Health (NIOSH) recommends that mine operators offer a medical examination before job placement and at least every three years thereafter. Examinations should include:

- » Work history with information on silica exposures
- » Evaluation for signs and symptoms of respiratory disease
- » Chest x-ray
- » Breathing test (pulmonary function)
- » Tuberculosis evaluation (if the physician recommends it)

Mine operators must report to MSHA cases of silicosis or other occupational lung disease for which a medical diagnosis or notice of an award of compensation is received by a miner or for which a chest x-ray confirms silicosis.

For more information, contact your local MSHA office, the national office (202-693-9414) or the Pittsburgh Safety and Health Technology Center (412-386-6901).

Our job is to protect your health.

*U.S. Department of Labor
Mine Safety and Health Administration
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