

function test, and evaluation for tuberculosis should be conducted. All underground coal mine workers are encouraged to participate in the required x-ray program.

10. Is reporting occupational illness mandatory?

MSHA law obligates mine operators to report any cases of silicosis or other occupational lung disease for which a medical diagnosis or a notice of an award of compensation is received involving a mine worker. MSHA policy states that a chest x-ray reading of 1/0 or above (using the International Labor Office classification system) is a reportable occupational illness.

For additional information and assistance, contact:

- » Your local MSHA office
- » **Metal/Nonmetal Mine Safety and Health**
Arlington, Virginia
202-693-9630
- » **Coal Mine Safety and Health**
Arlington, Virginia
202-693-9510
- » **Pittsburgh Safety and Health Technology Center –**
Pittsburgh, Pennsylvania
412-386-6901

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Mine Safety and Health Administration
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Hazards of Silica to Underground Coal Miners



Health Hazard Information Card HH-5

1. What is silica?

“Quartz,” “crystalline silica,” “free silica,” or simply “silica” are all terms that refer to quartz. Quartz is silicon combined with oxygen (silicon dioxide – SiO₂), a natural mineral found abundantly worldwide in nearly all mineral deposits, in common rock formations, sand, and soil.

2. What is silicosis?

Silicosis is a disease of the lungs due to breathing dust that contains silica. Silica dust causes fibrous or scar tissue to form in the lungs which then reduces the lungs’ ability to exchange oxygen with waste gases produced by the body. There is no cure for silicosis – prevention is the only answer.

According to NIOSH:

- ✓ more than one million miners and other workers are exposed to dangerous levels of silica.
- ✓ at least 100,000 of these workers are at high risk of developing silicosis.
- ✓ more than 250 deaths per year are attributed to silicosis.

Besides being the cause of silicosis, quartz is on a suspected list of carcinogens.

11. Where are workers exposed to silica dust?

Highest incidents of exposure occur when drilling into rock, loading, and hauling. Operating equipment such as locomotives, roof bolters, continuous miners, and shuttle cars increase the probability of exposure. Any workers downwind of this equipment are also at high risk. Wherever silica is part of coal dust, all coal mine workers are vulnerable.

12. How is MSHA addressing exposure to silica?

MSHA mandates dust sampling by mine operators and provides for analyzing the samples. Inspectors conduct dust sampling as well as monitor the operators’ program. MSHA also requires engineering and administrative controls to inhibit and limit dust exposure to workers.

13. What is the mine operator’s responsibility?

Operators must provide engineering controls such as dust collectors, water or wetting agents (for drilling and wetting down other dusty areas), ventilation, or any other approved effective methods.

In addition, operators need to monitor workplaces, maintain equipment and controls, train workers in hazard awareness, introduce administrative controls, and insist on good work practices.

14. What can workers do to limit their exposure?

Workers must use controls provided and proper work practices to help prevent the generation of dust. For example, after bagging dust, roof bolter operators need to

position the bags for collection in an area where the dust cannot be liberated. Another example would be for drill operators to keep an adequate quantity of water on the area being drilled. Once silica is airborne, it is especially difficult to capture and will remain suspended indefinitely.

15. What are the symptoms of silicosis?

Silicosis develops in stages, and it is “progressive,” that is – once it is established in the lungs, it will continue to advance even though there is no further exposure to the dust. Early stages may go unnoticed. As exposure continues, the affected worker will experience shortness of breath upon exertion, possible fever, and occasional bluish skin at the ear lobes or lips. Indications of advanced stages are extreme shortness of breath, loss of appetite, constant fatigue, and pain in the chest. Due to silicosis, the lungs are more susceptible to infectious lung diseases. The heart, working harder to supply oxygen to the body, enlarges and is now damaged as well.

16. How long does it take to develop silicosis?

Acute silicosis may develop after short periods of exposure to high levels of quartz. Chronic silicosis usually occurs after several (10 or more) years of exposure to lower levels of quartz.

17. How is silicosis determined?

Silicosis is diagnosed from x-rays. If an x-ray shows evidence of silicosis, a medical examination that includes medical history, work history of exposure to silica, pulmonary