

Exposure to Coal Mine Dust Containing Quartz



Health Hazard Information Card HH-47

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

Breathing excessive amounts of respirable coal mine dust containing quartz particles can cause either black lung disease or silicosis, both of which are disabling and sometimes fatal. The level of quartz dust and coal dust in the mine air and the length of time the miner is exposed to this environment will determine how quickly lung disease develops. If quartz levels are high enough, silicosis can develop in as little as three years.



The Facts About Quartz Dust

- ✓ Quartz is one of the most common naturally occurring minerals. It is found in most classes of rock and, therefore, can occur almost anywhere.
- ✓ According to the National Institute for Occupational Safety and Health, respirable quartz dust particles are 20 times more toxic to the lungs than coal dust alone. This is because of their physical shape and smaller size, crystalline structure, and how they react with the lung tissue compared to coal dust particles.
- ✓ Because quartz is so hazardous, MSHA lowers the standard below 2.0 mg/m^3 (milligrams per cubic meter) when quartz is present in order to maintain miners' exposures to no more than 0.1 mg/m^3 or $100 \text{ } \mu\text{g/m}^3$ (micrograms per cubic meter).
- ✓ When inhaled quartz-containing dust reaches the deepest parts of the lung, it reacts with the sensitive lung tissue causing fibrous scar tissue to form. This scarring reduces the lung's ability to extract oxygen from the air.

- ✓ Exposure to any level of respirable quartz dust **may** put you at increased risk of developing a disabling and potentially fatal lung disease.

Quartz Exposure Data

- ✓ Continuous miner operators and roof bolt-ers were associated with 73% of all exposures above 100 $\mu\text{g}/\text{m}^3$ of quartz in calendar year 2007.

Calendar Year 2007 Quartz Samples			
	# Analyzed	# With 100 $\mu\text{g}/\text{m}^3$ or More	# With 250 $\mu\text{g}/\text{m}^3$ or More
# Below the Standard	3608	364	27
# Above the Standard	620	311	58
Totals	4228	675	85

The Symptoms of Silicosis

- ✓ Silicosis may not cause any symptoms at all during early stages of the disease.
- ✓ Later symptoms may include shortness of breath (sometimes extreme), possible fever, occasionally bluish skin at the ear lobes or lips, loss of appetite, fatigue, pain in the chest cavity, and respiratory failure, which may eventually lead to death.
- ✓ Silicosis makes a person more susceptible to infectious diseases of the lungs such as pneumonia and tuberculosis.
- ✓ Short periods of exposure to high levels of quartz-containing dust may lead to the development of silicosis in as little as 3 years.
- ✓ Long-term, low-level exposure has caused silicosis, and in some instances death, after 10 or more years of exposure.
- ✓ Silicosis continues to progress once exposure ends due to quartz's increased toxicity to the lungs and the chemical reaction between the lung tissue and the quartz-containing dust.
- ✓ Currently available treatments may relieve or reduce the symptoms associated with silicosis, but, as with black lung disease, there is no cure for silicosis.

Prevention is the only answer!

If you have questions about coal mine health matters, please contact your local MSHA office or visit MSHA's website at www.msha.gov.