

Exposure to Coal Mine Dust Containing Quartz

Health Hazard Information Sheet 47

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



Breathing excessive amounts of respirable coal mine dust containing quartz particles can cause silicosis and black lung – disabling and sometimes fatal lung diseases. How quickly these lung diseases develop will depend on the amount of respirable quartz and coal dust in the mine atmosphere where miners work or travel, and on the amount of time the miner spends working in such an environment. A miner exposed to high levels of quartz can develop silicosis in as little as three years. A review of recent MSHA samples analyzed for quartz dust clearly indicates that miners who perform certain job functions, such as roof bolting, continuous miner operation, and surface drilling, can be exposed to an excessive amount of dust containing quartz.

MSHA has developed this information to assist miners and mine operators in understanding the dangers of black lung. Use this as your guide to **ACT NOW** and **END Black Lung**.

What You Should Know About Quartz Dust

- Quartz is one of the most common, naturally occurring minerals on Earth. It is found in most rock, and therefore can be almost anywhere.
- Quartz particles are 20 times more toxic to the lungs than coal dust alone according to the National Institute for Occupational Safety and Health (NIOSH). This is because of the particular shape and smaller size of quartz particles, its crystalline structure, and the way quartz particles react with lung tissue compared with coal dust particles.
- Quartz-containing dust reacts with the sensitive tissue of the lungs, causing fibrosis or scar tissue that reduces the lung's ability to extract oxygen from the air.
- Because exposure to respirable quartz dust presents a serious health hazard to miners, MSHA lowers the maximum dust limit of 2.0 milligrams per cubic meter (mg/m^3) when the respirable dust in the mine atmosphere contains more than 5 percent quartz. Doing so limits miners' quartz exposure to no more than $0.1 \text{ mg}/\text{m}^3$ (or 100 micrograms per cubic meter).

- Exposure to quartz-containing dust at any time poses a potential health hazard, putting a miner at risk of developing a disabling and potentially fatal lung disease.

The Symptoms of Silicosis

- Silicosis may not cause any symptoms at all during the early stages of the disease.
- Symptoms after continued exposure may include shortness of breath (sometimes extreme), possible fever, occasional bluish skin at ear lobes or lips, loss of appetite, fatigue, pain in the chest cavity, and respiratory failure, which may lead eventually to death.
- A person with silicosis is 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 three years.
- Long-term, low-level exposure has caused silicosis, and in some cases, 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 treatment may relieve or reduce the symptoms associated with silicosis, but, as with black lung, there is no cure for silicosis.

—Remember—

Black lung is NOT curable, but it is preventable!

If you have questions about coal mine health matters please contact your local MSHA office or see the MSHA website at www.msha.gov.