

PREVENTING SILICOSIS

Silica is one of the most common minerals in the earth's crust. At least 1.7 million U.S. workers are potentially exposed to it. And it can be deadly! Every year more than 250 silicosis-related deaths occur in the United States.

Silicosis. Silicosis is a fibrotic lung disease caused by the inhalation of microscopic particles of crystalline silica. Silica is generally found in the crystalline form, the most common type being quartz; glass is a non-crystalline form.

Symptoms of silicosis may include shortness of breath, severe cough, fatigue, loss of appetite, chest pains, and fever. Although silicosis usually occurs after 10 or more years of overexposure to silica, very high levels (such as from sandblasting, rock drilling, or quartz milling) can result in symptoms within a few weeks to 5 years. Unfortunately, there is no cure for silicosis and the disease can develop or progress even after exposure to silica ends.

Where do exposures occur? Silica exposure occurs in a wide variety of industries, and employers and workers often are not aware that dust in their workplace contains silica. Sand, rock, soil, concrete, mortar, plaster, and other common substances may contain silica. Many activities may cause overexposures: (1) mining and milling; (2) abrasive blasting, chipping, and grinding in construction; (3) manufacturing of glass, cement, metal products, ceramics, soaps, and cosmetics; and (4) plowing, harvesting, and burning of agricultural waste.

How much is too much? When it comes to disease, a little silica goes a long way. The Cal/OSHA permissible exposure limit (PEL) for respirable quartz is 0.1 milligrams per cubic meter of air (mg/m^3). To put this in perspective, the PEL for respirable aluminum oxide (a substitute for sand in abrasive blasting) is $5 \text{ mg}/\text{m}^3$ or 50 times higher. Air monitoring by a trained professional can determine the level of silica exposure in your workplace.

Controlling exposures. It's best to reduce overexposures by substituting less hazardous materials and using engineering controls such as local exhaust ventilation and wet methods. However, sometimes these are not possible or don't reduce exposures enough. Then, respiratory protection is necessary. For overexposures up to 10 times the PEL, a half-mask, air-purifying respirator with HEPA or P100 filters is the minimum level of protection that is appropriate. But many operations, especially in construction, will need higher levels of protection.

For more information, visit the NIOSH web site at <http://www.cdc.gov/niosh/topics/silica> or call NIOSH at 1-800-35-NIOSH. If you need assistance identifying or controlling silica overexposures in your workplace, your loss control representative can put you in touch with a State Fund industrial hygienist.

Beth Mohr, Ph.D., CIH is a Certified Industrial Hygienist assigned to State Fund's San Francisco and San Jose Districts.