


Inhaling Silica Dust Can Cause Deadly Lung Disease



Crystalline silica is found in granite, artificial/engineered stone, and other stone products. When workers cut, grind, drill, or polish these materials, very small particles of crystalline silica dust get in the air. Breathing in these very small (respirable) crystalline silica particles can cause irreversible scarring in the lungs, trouble breathing, permanent disability, and death. Crystalline silica dust can also cause lung cancer, kidney damage, and autoimmune disease.

Employers Must Ensure that Workers are Protected from Exposure to Crystalline Silica

- Minimize exposures through effective engineering controls and work practices.
- Provide and ensure proper use of respirators until exposures are reduced below the PEL or if exposures cannot be reduced with engineering controls and work practices.
- Provide initial and periodic medical examinations to exposed workers.
- Train workers on the health hazards, workplace exposures, measures implemented to protect workers, and their roles in protection.
- Learn more about worker exposures to silica at the Worker Crystalline Silica web page.

Assess employee exposures to crystalline silica dust to ensure they are not above the occupational safety and health administration (OSHA) permissible exposure limit (PEL) of 50 µg/m³ averaged over an 8-hour work day.

Go to www.osha.gov/ehp/ncit/crystalline/ for more information.

CDC **NIOSH**

Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

Outbreak of Silicosis among Engineered Stone Countertop Workers in Four States

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Go to www.osha.gov/dsg/topics/silicacrystalline/ for more information.

Train workers on the health hazards, workplace exposures, measures implemented to protect workers, and their roles in protection.

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Image available [here](#)

Engineered stone countertops, also known as “quartz surfacing,” are made from quartz aggregate held together with a resin binder. These materials are similar in appearance to natural stone and have become increasingly popular for use in home building and home improvement. Quartz surface imports to the United States have increased approximately 800% during 2010–2018 (U.S. International Trade Commission). Engineered stone materials may contain substantially more crystalline silica than natural stone (>90%, compared with <45% in granite) (OSHA/NIOSH Hazard Alert). Tasks such as cutting, grinding, polishing, and drilling can release hazardous levels of silica dust into the air. Inhalation of dust from silica-containing materials, such as engineered stone, can lead to silicosis. Silicosis is a progressive, debilitating, incurable, and sometimes fatal disease that results from scarring of the lungs, causing permanent lung damage.

Exposure to silica dust is a health hazard for workers who manufacture, finish, and install natural and engineered stone countertop products. Symptoms of silicosis may include cough, fatigue, shortness of breath, or chest pain. Silicosis typically occurs after 10 or more years of exposure to respirable crystalline silica. However, high levels of exposure can lead to more rapid development and more severe lung

disease. In addition to silicosis, breathing in very small (“respirable”) crystalline silica particles can cause lung cancer, chronic obstructive pulmonary disease (COPD), and kidney disease, and is associated with the development of lung infections, autoimmune disorders, and cardiovascular impairment.

One case of silicosis associated with engineered stone fabrication was previously reported in the United States from Texas (Friedman, 2015). More recently, 18 cases of silicosis, including two fatalities, have been identified among workers in the stone fabrication industry in California, Colorado, Washington, and Texas (Rose and Heinzerling, 2019). Many of these workers worked primarily with engineered stone materials and were less than 50 years of age. Outbreaks of silicosis have also been reported among engineered stone workers in Israel, Spain, and Australia (Kramer, 2012; Perez-Alonso, 2014; Hoy, 2018; Leso, 2019). Medical screening offered to all at-risk stone fabrication workers in Queensland, Australia, has identified silicosis among 12% of workers (Kirby, 2019). In 2018, there were nearly 9,000 establishments with 96,000 employees in the stone fabrication industry in the United States (Bureau of Labor Statistics quarterly [census of employment and wages](#)). As many of these employees probably have not undergone medical examinations, it is likely that additional cases of silicosis remain unidentified in the US.

Employers must ensure that workers are protected from exposure to crystalline silica. The federal Occupational Safety and Health Administration (OSHA) has issued two [respirable crystalline silica standards](#) to protect workers. The standards for construction (29 CFR 1926.1153) and for general industry and maritime (29 CFR 1910.1053) both took effect on June 23, 2016. Similar standards have also been implemented in state OSHA jurisdictions over the past few years. Employers must comply with the applicable federal or [state](#) OSHA standards to ensure that employee exposures, at a minimum, are not above the permissible exposure limit (PEL) for respirable crystalline silica of 50 micrograms per cubic meter of air (50 $\mu\text{g}/\text{m}^3$), averaged over an 8-hour work day. More information on the final silica rule,

requirements for employers, and specific implementation dates for federal OSHA can be found [here](#).

Silicosis is preventable when exposure to respirable silica dust is minimized through effective engineering controls and work practices. Engineering controls such as wet methods and ventilation should be used to control exposure to dust. Work practice controls, including appropriate housekeeping procedures, can be used along with engineering controls to protect employees. NIOSH-approved respiratory protection should be provided to employees when silica dust levels are hazardous and where required by the silica rule. Respiratory protection is the least effective control measure.

Under the OSHA silica rule, engineered stone countertop workers exposed to hazardous levels of silica dust must be examined by a licensed healthcare provider. The examination must include a respiratory questionnaire, physical examination, chest X-ray interpreted by a [NIOSH certified B reader](#), and spirometry. Healthcare providers who suspect that a patient's health problems are caused by working with quartz-containing materials should report the case to their local or state health department. Additionally, physicians can direct questions about silicosis reporting to silicosisreporting@cdc.gov. In 2017, silicosis was a reportable condition in [22 states](#) (state Occupational Safety and Health contact information can be found [here](#)).

Hazard alerts published in [California](#), [Washington](#), and [Texas](#) provide information on silica dust exposure, requirements for controlling dust, and resources for exposed workers. A webinar describing the dangers of silica exposure, employer requirements to comply with OSHA's Respirable Crystalline Silica Rule, and methods employers can use to protect workers is available [here](#).

The NIOSH Health Hazard Evaluation (HHE) Program provides free assistance and information to employees, employee representatives, and employers on workplace silica exposures and employee health. More information about the NIOSH HHE program can be found at the NIOSH HHE [Topic Page](#). If you are interested in working with NIOSH,

employees, union officials, or employers can request an evaluation of possible health hazards at their workplace [here](#).

This blog focuses on worker exposure to high levels of silica over time. We cannot provide individual medical advice and will not post comments related to potential exposures of the general public/consumers/homeowners. Contact your physician if you have concerns about your health.

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The authors would like to thank Ketki Patel, MD, PhD, Senior Epidemiologist at the Texas Department of State Health Services.

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