

Working Safely With Silica: Health Hazards and OSHA Compliance

By Rick Pedley | Wednesday, December 8, 2021



About 2.3 million American workers are exposed to silica, including those in construction, oil and gas, agriculture and manufacturing. Silica is commonly found in a range of construction materials and when this material breaks apart, small particles are released into the air, creating what's known as respirable crystalline silica. These particles can get into a person's respiratory tract, which can lead to a range of serious and potentially fatal illnesses including silicosis, lung cancer, chronic obstructive pulmonary disease and kidney diseases.

The Occupational Safety and Health Administration has set clear regulations for working with this substance, so construction workers and managers can know the risks of inhaling this substance and protect themselves on the job site.

WHAT IS SILICA?

Crystalline silica is a mineral that forms naturally in the earth. Raw construction materials such as sand, stone, concrete and mortar often contain deposits of crystalline silica, which can put employees at risk. Silica becomes a danger to workers when it is released into the air and breathed in.

When workers cut, grind, saw or sand down these materials, tiny particles known as respirable crystalline silica will permeate the air. These particles are around 100 times smaller than a grain of sand. Many aspects of the manufacturing process can release these particles into the air. It also tends to be common in the fracking and oil refining industries or any place where people are working with natural construction materials.

Those that breathe in silica dust face a higher risk of silicosis, an incurable lung disease that can lead to disability, lung cancer, chronic obstructive pulmonary disease (COPD), kidney disease and death. While any exposure to silica is considered dangerous, the risk level depends on the length of exposure and how



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much dust is in the air.

Silica dust remains an all-too-common problem in the workplace. OSHA estimates that around two million construction workers are exposed to respirable crystalline silica in over 600,000 workplaces.

WHAT ARE THE OSHA GUIDELINES FOR WORKING WITH SILICA?

OSHA has issued specific guidelines for those that work with silica in the construction industry, known as 29 CFR 1926.1153. The rule gives employers and workers several options for complying with the law.

The first option is to follow the agency's specific guidelines for using different types of equipment, including drills, saws and blades. In many cases, the best option is to use equipment with an integrated water delivery system that feeds water into the construction material. Adding moisture during the cutting, sanding or grinding process significantly reduces the amount of silica dust in the air. Other methods include using a vacuum system to remove silica dust from the air. The agency also recommends following the manufacturer's guidelines for reducing silica dust.

The regulations also depend on whether the person is working indoors or outdoors. Workers should always wear a dust mask that covers their nose and mouth when using these tools indoors. However, this may not be necessary outdoors unless the person is working continuously for more than four hours.

If workers and managers don't want to comply with option one, they can implement their own silica dust control methods.

Employers must first test the amount of silica dust their workers may be exposed to during an eight-hour workday if they suspect the level may be at or more than 25µg/m³ (micrograms of silica per cubic meter of air), averaged over an 8-hour day. They must then take action to protect their workers if the level is above the permissible exposure level of 50µg/m³, averaged over an 8-hour day.

National Institute for Occupational Safety and Health recommends using half-face particulate respirators with N95 or better filters for airborne exposures to crystalline silica. Regardless of filter type, number or half-face vs. full-face, a fit test should be performed. This ensures the respirator mask has a proper seal and the user does not risk inhaling dust.

Though it's recommended to test and measure the amount of silica dust in a space, it may not always be practical and can be difficult to do for some industries. The first solution is to use dust control techniques to limit the amount of silica dust in the air. If the dust cannot be removed or when in doubt that it is at a safe level, workers should wear respirators or dust masks in the workplace.

BEING PREPARED AND PROACTIVE WITH REGULATIONS

A written exposure plan which identifies certain tasks and areas where silica dust is present should be established and implemented. It should also include prevention techniques and safety measures, such as restricting access to areas with high levels of silica dust. Every company or team should designate a competent person that will be in charge of implementing this plan.

OSHA also recommends avoiding housekeeping activities, such as using compressed air to get rid of dust, without proper ventilation.

The company will also need to provide medical examinations including regular x-rays and chest exams to workers that need to wear a respirator for 30 days or more per year. However, it's best practice to do these exams upfront with new hires as a baseline and immediately catch if they develop a silica-related condition or ensure it doesn't get worse.

Managers must train their crews on the risks of working with silica and how they can reduce their exposure. These regulations should be posted throughout the workplace.

It's also important to keep records of possible silica exposure, medical records and prevention techniques used in the workplace. Teams will need to refer to this information to show the agency that they are complying with the latest regulations.

The company should inspect and maintain all safety equipment, including face masks and respirators, to make sure workers have access to the tools they need. This equipment should also be adjustable so it fits over the person's nose and mouth properly. If the seal is loose, silica dust may slip inside. If the mask is

too tight, it may impair the person's ability to breathe.

Breathing in silica dust remains one of the most common hazards in the construction industry. Everyone working on site should be aware of this information so they can protect themselves from exposure.



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