

Respirable Crystalline Silica

Close to 2.3 million individuals are exposed to respirable crystalline silica in construction and general industries. Exposure occurs during specific work-related tasks that create respirable silica dust, very small crystalline silica particles, that are inhaled. To provide a comparison, respirable crystalline silica is at least 100 times smaller than sand particles found on beaches.

Over a period of time, exposure is harmful and possibly lethal. Respirable crystalline silica exposure can significantly increase the risk of cancer, silicosis, chronic obstructive pulmonary disease and kidney disease. To better protect works, The Occupational Safety and Health Administration (OSHA), on March 25, 2016 finalized two new silica standards, one for general industry, maritime and for construction.

What is Crystalline Silica?

Crystalline silica is a common mineral that is found in naturally occurring materials such as sand, stone, rock, concrete, brick, block, mortar, glass, artificial stone and ceramics. Construction operational tasks such as cutting, sawing, drilling and crushing of concrete, brick, block and mortar generates respirable crystalline silica. Industrial sand used in certain operations such as glass manufacturing, foundry work and hydraulic fracturing (fracking) is also a source of silica exposure.

Why are there new standards?

New silica standards were created because the current OSHA permissible exposure limits (PELs) are outdated and scientific research studies were over 40 years old. OSHA created standards to limit worker exposure in 1971 when it came into existence. The current permissible levels do not reflect the more recent scientific evidence that shows low-level exposures to silica may cause serious health effects including lung and kidney cancer. In addition, there are discrepancies with measuring worker exposures to silica and the permissible levels in construction and shipyards compared to general industry are twice as high.

The new OSHA established PEL is 50 micrograms of respirable crystalline silica per cubic meter of air ($\mu\text{g}/\text{m}^3$), averaged over an eight-hour day ($50 \mu\text{g}/\text{m}^3$). This level will provide the same coverage for all workers and reduce risk of disease among workers who inhale crystalline silica. By using engineering controls and best work practices, OSHA maintains that this is achievable.

How do employers minimize risk factors?

Employers must implement engineering controls and work practices that keep exposures at or below the PEL to reduce workers' exposure to silica dust. Specifically, employers are required to limit access to high exposure areas, provide training, provide respiratory protection when controls are not enough to limit exposure, provide written exposure control plans and measure

exposures in some cases. Employers are required to offer medical examinations to highly exposed workers.

Examples of engineering controls include but not limited to wetting down silica dust or using local exhaust ventilation such as HEPA equipped vacuums before personnel inhale the dust.

What are the protocols for air sampling?

Measuring for silica must be completed if individual exposures may be at or above an action level of 25 $\mu\text{g}/\text{m}^3$ averaged over an eight-hour day. Existing sampling and analytical methods can be used, however employers must ensure that the silica samples are analyzed by laboratories that meet the standards set forth in Appendix A of the new regulation.

OSHA specifies particular control measures in [Table 1](#) of the regulation that can be implemented.

What is the compliance schedule?

Meeting compliance deadline dates varies upon the type of industry. The final rule for both standards takes effect on June 23, 2016 but compliance to the rules varies depending upon industry. The schedule is as follows: Construction – June 23, 2017; General Industry and Maritime – June 23, 2018; Hydraulic fracturing – June 23, 2018 for all provisions except Engineering Controls which is effective June 23, 2021.

Where can I go for additional information?

Contact [PHASE Associates](#) for interpretation of the Silica regulation and implementation dates. We have experienced industrial hygienists that can develop and implement engineering controls and work practices; provide training and conduct air measurement sampling. PHASE Associates will provide the necessary support to protect personnel against respirable crystalline silica inhalation hazards.

References

<https://www.osha.gov/silica/>