Introduction: America’s worst industrial disaster was caused by workers exposure to crystalline silica. At least 764 of 1,213 men died within five years of the completion of the Hawk’s Nest tunnel from Silicosis.

The Occupation Health and Safety Administration (OSHA) updated the standards associated with the construction, general, and maritime industries on June 23, 2018. With compliance dates for construction of September 23, 2017 and general/maritime industries of June 23, 2018. The new standards lower the permissible exposure limit (PEL) to 50 µg / m³ and created an action level (AL) of 25 µg / m³ for occupational exposures.

What is crystalline silica? It is a common mineral found in the earth’s crust. It is contained in common materials in occupational environments such as brick, concrete, mortar, drywall, clay, sand, and drywall, but that is only a few of many materials.

When does it become a hazard? Crystalline silica becomes hazardous to humans when high-energy activities such as cutting or grinding breaks the material into tiny dust particles. Those dust particles measure less than 10 µg and is easily breathed into the lower part of our lungs. Breathing in excessive amounts of this dust, does not allow us to exhale all of the particles. The particles become lodged in the alveoli or air sacs. Over time and accumulation scar tissue and inflammation occurs that inhibits our ability to breathe. The disease is called Silicosis. This is only one of the adverse health effects that silica inhalation causes.

What can be done to prevent exposure to crystalline silica? OSHA has approved two different methods of controlling silica dust. The first method is using a dust collection system with specific requirements to collect the dust as it is produced during the work. Depending on the tool used a shroud or collection device collects the dust and removes it to a vacuum with high efficiency filters.

The second method is using a tool with an integrated water delivery system. The system sprays water onto the material as it is being cut or drilled to wet the dust down before it is airborne.

Additionally, an employee may be required to wear a respirator as well as using one of these methods of control. Respirator users need to be medically cleared, trained, and fit tested for any respirator that they are required to use.

People working in the construction industry have a table that OSHA supplied that lists the required method of control and respiratory protection required. The requirements based on the tool used, how long the task, and whether the task is completed indoors or outdoors.
Other industries require a competent person that is trained to recognize the hazard, to evaluate the activity and complete air sampling to quantify the amount of crystalline silica dust that is produced.

Based on their assessments, they may require certain controls are used, and possibly require the use of respiratory protection.

Cornell University Environmental Health and Safety (EHS) has staff that are trained to recognize crystalline silica hazards and complete assessments for employee who have concerns about their work tasks.

Additional information about crystalline silica is found on the EHS Silica webpage: https://sp.ehs.cornell.edu/osh/occupational-health/silica/Pages/default.aspx

For exposure assessments or additional questions contact EHS at:

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