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Week of June 13, 2016– OSHA's New Silica Standard

The Occupational Safety and Health Administration (OSHA) has issued a final rule designed to help control lung cancer, silicosis, chronic obstructive pulmonary disease and kidney disease in America's workers by limiting their exposure to respirable crystalline silica. The rule is comprised of two standards, one for Construction and one for General Industry and Maritime. This is OSHA's first (successful) updated regulation for the material since 1971.

According to OSHA, there are approximately 2.3 million workers who are potentially exposed to respirable crystalline silica, including 2 million construction workers and 300,000 workers in foundries and brick manufacturing facilities and at hydraulic fracturing sites.

Silica (SO_2), can be found in three general molecular forms, commonly known as quartz, cristobalite and tridymite. All three have the same molecular structure, however differ in their crystalline formation. While each one of these forms may be more prevalent in certain geologic formations, all three are common on construction sites, including soil, sand, concrete, masonry, rock, granite, and landscaping materials.

Occupational exposure limits are based on airborne concentrations where the particulate size can be so small that they cannot be seen by the naked eye. As such, they can bypass the various natural defenses of our bodies, and thereby, have the potential to reach the furthest regions of our respiratory system; the alveoli. Alveoli are the small air sacs where oxygen can enter into our blood stream and supply our cells with the vital resources to function. At the same time, carbon dioxide is removed from our bodies (as a cell waste-product) through the alveoli; however, in a reverse direction; which in turn, we eliminate from our respiratory system by exhalation. When the size particles of silica are so small that they can reach the alveoli, they are referred to as respirable silica, and have a diameter of 10 micrometers (microns) or less. Exposure to respirable silica can result in serious lung disease as well as lung cancer. It only takes a very small amount of airborne silica to create a health hazard. Because occupational health standards are based on only the respirable portion employee exposure assessments require a very specific sampling method; one in which only the "respirable" particulate is collected and sent for analysis.

OSHA's new rule also is intended to help protect against lung cancer, chronic obstructive pulmonary disease and kidney disease. The new permissible exposure limit for respirable crystalline silica – 50 micrograms per cubic meter of air averaged during an 8-hour shift – matches what NIOSH recommended in 1974. OSHA's new PEL is half the previous limit for general industry and 5 times lower than the previous limit for construction.

"Unfortunately, it has taken over 40 years for the politics to catch up with the science," Secretary of Labor Thomas Perez said during a March 24 press conference. "In the meantime, the industry has changed, technology has progressed, and businesses have innovated. A good government also adapts, even if it's long overdue."

The new rule covers engineering controls, protective clothing, medical surveillance and other issues. Highlights include:

- Lowering the permissible exposure limit for crystalline silica to 50 micrograms per cubic meter of air averaged during an 8-hour shift
- Mandating that employers use engineering controls and work practices to restrict worker exposure, bar access to high-exposure sites, supply respiratory protection when controls cannot curb exposures to the PEL, train employees, and offer medical exams to highly exposed workers
- Offering a table of specified controls that construction employers can follow for "greater certainty and ease of compliance" without monitoring exposure
- Allowing employers to have enough time to satisfy requirements by spacing out compliance dates

The two new standards – General Industry and General Construction - are scheduled to go into effect on June 23, 2016. Industries will then have one to five years to meet most requirements. The construction industry must comply by June 23, 2017; general industry, maritime and hydraulic fracturing must adhere to requirements by June 23, 2018; and hydraulic fracturing will have until June 23, 2021, to comply for engineering controls. The extended time allows employers to provide medical exams to workers, and gives hydraulic fracturing employers the opportunity to implement dust controls for the new PEL, OSHA states.

While OSHA's PEL has been significantly modified, it has been recognized that the major impact of OSHA's new rule is not the change in the permissible exposure limit, but rather it will (for the first time) require employers to regularly monitor the level of silica exposure in their workplaces and the health of their employees to insure companies are doing what is necessary to protect workers.

Prior to this ruling, OSHA had a published PEL for respirable silica; however it was based on a formula that required knowledge of the percentage of silica in the material-of-concern. Plugging values from 0% to 100% silica, yielded a PEL of 0.1 to 5 milligrams per cubic meter. These numbers were designed to simulate the OSHA PEL for respirable particulate (i.e. respirable nuisance dust) and the 1986 ACGIH TLV for respirable quartz. Based on the accumulating evidence of medical and epidemiological research, OSHA recognized the necessity to update it's PEL.

Key Provisions

- Reduces the permissible exposure limit (PEL) for respirable crystalline silica to 50 micrograms per cubic meter of air, averaged over an 8-hour shift.
- Requires employers to: use engineering controls (such as water or ventilation) to limit worker exposure to the PEL; provide respirators when engineering controls cannot adequately limit exposure; limit worker access to high exposure areas; develop a written exposure control plan, offer medical exams to highly exposed workers, and train workers on silica risks and how to limit exposures.
- Provides medical exams to monitor highly exposed workers and gives them information about their lung health.
- Provides flexibility to help employers — especially small businesses — protect workers from silica exposure.

There is nothing noble in being superior to your fellow men. True nobility lies in being superior to your former self. - Ernest Hemingway