OSHA's New Crystalline Silica for Construction Rule
Information and Guidelines for Compliance

In late March, OSHA released its final rule for Crystalline Silica for Construction. The new standard goes into effect on June 23, 2016, but OSHA is allowing construction employers some time to move into compliance. Enforcement will begin on June 23, 2017, except requirements for laboratory evaluation of exposure samples, which OSHA will start enforcing on June 23, 2018.

NUCA, as a member of the Construction Industry Silica Coalition (CISC), will file a petition for review of the final silica rule based on several issues that may allow for a legal challenge to the rule. The coalition will argue that OSHA has not fulfilled its obligation to provide documented evidence that the new, stricter requirements will reduce enough silicosis-related illnesses to warrant the rule's enormous financial burden on contractors. The CISC seeks to prove that the cost for compliance has been underestimated by OSHA and that the methods of compliance required by OSHA are excessive and technologically unworkable. However, in the event that a legal challenge is unsuccessful and OSHA's final rule remains as is, NUCA members should start considering how they will comply with the requirements now. Below is information and guidelines about the new regulation, its requirements, and ways to move toward compliance.

Why OSHA Revised the Existing Rule

Worker exposure to crystalline silica dust often goes unchecked in construction because many managers and workers regard dust as just part of the job. Unfortunately, many workers don't know and/or understand that dust containing crystalline silica can be dangerous if inhaled. Every year personnel in the construction industry die from exposure to silica dust, and hundreds more become disabled from related diseases.

Over exposure to crystalline silica dust can cause silicosis, which is marked by inflammation and scarring in the form of nodules in the lungs. When small silica dust particles are inhaled, they can embed themselves in the tiny alveolar sacs and airways in the lungs, where oxygen and carbon dioxide gases are exchanged. Once silica dust is embedded, the lungs cannot clear out the dust by mucous or coughing. Silicosis (especially the acute form) is characterized by shortness of breath, fever, and cyanosis (bluish skin). It can be deadly, especially if a person is exposed to very high levels for one to three years. However, in most cases, the damage is a gradual decrease in lung function. Silicosis increases a person's susceptibility to lung infections and lung cancer. Based on epidemiological studies, crystalline silica has been classified as a known human carcinogen. No effective treatment exists for silicosis.

Many attempts have been made to collect information on silica dust exposure in the construction industry. Due to the problems associated with the dynamic environmental nature of construction work and the variable work practices, exposure levels for specific tasks within the construction setting have not been well characterized. Other variables such as wind velocity, ambient temperature, and relative humidity also affect sampling data.

Overview of Silica Rule's New Requirements

The most notable change from the proposed rule to the final rule is its separation into two rules, one for general industry and one for construction. It may be useful download and print the requirements for the construction industry for reference because I will reference Table 1 and other important sections of the regulation throughout this document. This link is on the main email page that has the link to this document.

Compliance for Operations in Table 1

The rules for construction have been expanded and clarified in Table 1, which applies to equipment and operations common on a construction site. Table 1 pairs some of the most common construction operations with known dust control methods, so employers know exactly what actions are required to limit worker exposure to silica dust. The most common method specified is water to keep the dust under control. Employers who are able to fully and properly implement the controls specified in Table 1 for a specific operation will be considered in compliance with paragraph (e)(1) – *Respiratory Protection* for that operation as long as other workers in the area are not exposed to silica dust.

OSHA believes the standard provides flexible alternatives, especially useful for small employers. Employers can either use a control method laid out in Table 1, or they can measure workers' exposure to silica and independently decide which dust controls work best to limit exposure to the permissible exposure limit (PEL).

Alternative Exposure Control Methods to Those in Prescribed in Table 1

The new standard has reduced silica's permissible exposure Limit (PEL) and created a new action level. Employers who do not use the control methods listed in Table 1 must do the following:

- Measure the amount of silica that workers are exposed to if it may be at or above an action level of 25 μg/m³, averaged over an eight-hour day.
- Protect workers from respirable crystalline silica exposures above the PEL of 50 μg/m³.
- Use dust controls to protect workers from silica exposures above the PEL.
- Provide respirators to workers when dust controls cannot limit exposures to the PEL.

Other Compliance Requirements

In addition to the requirements spelled out in Table 1 or its alternatives, all construction employers covered by the standard must do the following to be in compliance with the new regulation:

- Establish and implement a Written Exposure Control Plan (WECP) that identifies tasks that involve exposure and methods employers will use to protect workers, including procedures to restrict access to work areas where high probability of exposure may occur.
- Designate a competent person to implement the WECP.
- Restrict housekeeping practices that expose workers to silica where feasible alternatives are available.
- Offer medical exams, including chest X-rays and lung function tests, every three years for workers who are required by the standard to wear a respirator for 30 or more days per year.
- Train workers on operations that could result in, and ways to limit, silica exposure.
- Keep records of workers' silica exposure and medical exams.

Creating a Written Exposure Control Plan (WCEP)

OSHA's new rule requires every employer with workers who may potentially be exposed to crystalline silica dust to establish and implement a WECP that contains the following information:

- All tasks in the workplace that involve exposure to silica dust.
- Methods used to limit employee exposure, including engineering controls, safe work practices, and respiratory protection (respirators).
- Housekeeping practices used to limit exposure.
- Procedures to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposure generated by other employers.

Employers must make the written program available to OSHA, employees, and their designated representatives. The employer must evaluate the effectiveness of the program annually. The employer must also designate a competent person to make regular inspections of the jobsite, materials, and equipment used to implement the control plan.

How Exposure Can Occur

Crystalline silica is a naturally occurring mineral; quartz is its most common form. Because crystalline silica is a major component of sand, granite, and other rock materials, it is commonly found in the construction environment.

Many tasks in construction generate dust containing crystalline silica. Activities where worker exposure can occur include grinding or cutting concrete, using a jackhammer to break rock or concrete, drilling rock, tunneling, cement mixing, sand blasting, and using mobile excavation equipment (loaders, graders, dozers, etc.). Even dry sweeping and other activities that generate a visible cloud of dust can create an exposure. A cloud of dust could indicate that silica is in the air.

On jobsites where the potential for exposure is high, such as where sand blasting or concrete grinding is occurring, implement the controls specified in Table 1 where possible, or take air samples and have them evaluated by an approved laboratory. If data exceeds the 8-hour time-weighted-average (TWA) established by OSHA's new rule, action must be taken. The new TWA sets the action level at 25 $\mu g/m^3$ and the permissible exposure limit at 50 $\mu g/m^3$, both of which are lower than they were before the final rule was published.

Controlling Silica Exposure

Employers will need to be proactive to reduce the possibility of employee exposure to dangerous levels of silica. The first step is to develop a site-specific safety and health plan that identifies work sites and job tasks that represent a risk to employees. The plan should identify when and where silica dust may be generated and address engineering controls, PPE, and safe work practices. Creating a plan before work begins will help to effectively control or eliminate dust.

Implement the plan if visible dust clouds are observed as work is performed, while equipment is operating, or even as trucks roll in and out of the site. Use wet down methods to control the dust. If you cannot control the dust to the point where it is not readily visible, then you will probably need to implement alternate exposure control methods.

Assign a Competent Person

Under paragraph (g)(4), the new rule requires the employer to assign a competent person to make frequent and regular inspections of jobsites, materials, and equipment to implement the WECP. The new regulation defines a competent person as an individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize such hazards. The CP must have the knowledge and ability necessary to fulfill the responsibilities set forth in paragraph(g) of the standard.

Train All Employees

Employee education is important to the success of any plan. Every employee who may be exposed to dust should understand the WECP, potential hazards of exposure, and what he/she is expected to do. While responsibilities for each employee may vary, from merely staying clear of any exposure hazards to implementing specific control methods, it is imperative that all employees know what is expected of them.

Using Wet Down Methods

Studies of actual construction jobsites have concluded that one way to lower silica dust levels is to use a water-spray control using a readily available nozzle at a low flow rate. Water spray may not completely eliminate dust but it has been proven that it can considerably reduce the amount of airborne dust generated on work sites. Water supplied at a low flow rate does not have to add a substantial amount of water to the work surface. Additionally, use of a water-spray control device should not wet the workers' clothing or shoes.

Wetting down an area where dust has settled before sweeping or removal will also keep the dust down. Dry sweeping compounds are also available to control dust during cleanup and is especially useful for removing dust from buildings as well as vehicle and equipment floors. The OSHA regulation prohibits dry sweeping or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica, unless wet sweeping, HEPA-filter vacuuming, or other methods that minimize the likelihood of exposure are not feasible.

Some local and state ordinances require construction contractors to minimize dust to reduce public exposure and dust in general. Using a water truck to spray water on access roads will reduce the dust levels as well as reduce potential public and employee exposure.

If you can't find what you need commercially, make your own water-spray dust control. To find out how, visit the NJ Laborers website: How to Make Your Very Own Jackhammer Spray Dust Control or NIOSH.

Using Dust Collection Systems

Although not as effective outdoors as wetting, dust collection systems can also be set up to collect dust at the source. Portable dust collection systems (vacuums with HEPA filters) are available commercially.

Isolating Equipment Enclosures

To isolate equipment operators and truck drivers from dust, provide mobile equipment with enclosed positive-pressure cabs with air conditioning and filtered air supply. Older cabs can be retrofitted with air conditioning and filtering systems. In a retrofitting situation, make sure to locate vents in higher positions to prevent incoming air from stirring up dust on the floor. Use high-efficiency intake and recirculation filters to capture dust. Cab doors and windows should seal properly, remain in good condition, and closed when working in dusty areas.

Equipment and vehicles should be cleaned out regularly to prevent dust buildup. When it comes time to remove dust from vehicles and clothing, use a vacuum cleaner with a high-efficiency filter or a dust control compound to sweep up the dust. Workers should be instructed not to blow dust from their clothing or skin with compressed air since dust could be blown into the workers' breathing zone.

Prohibit the Use of Compressed Air

Compressed air should not be used to clean dust from clothing or skin. Compressed air is a concentrated stream of air at high pressure which has the potential to enter the blood stream through an open wound or other break in the skin. An air bubble in the blood stream is known medically as an embolism, a dangerous medical condition in which a blood vessel is blocked. Because the consequences of even a small quantity of air or other gas in the blood can quickly be fatal, compressed air should never be considered as a method of dust removal.

Using Respirators

While in some situation respirators may be used, it is important to note that they may not provide adequate protection. NIOSH recommends the use of half-facepiece particulate respirators with N95 or better filters for airborne exposures to crystalline silica at low concentrations. OSHA also specifies the

use of at least an N95-rated mask or respirator (29 CFR 1910.134). Paper filter dust masks must be rated N95 or N100. The rating can be located on the respirator or packaging. If respirators are required, a comprehensive respirator program, including fit-testing must be instituted prior to use. The requirements for a comprehensive respirator program may be found in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Controlling Worker Exposure to Crystalline Silica

The key to preventing silicosis is controlling dust that may contain crystalline silica. Construction managers and safety directors must understand common exposure risks and plan ahead to control or eliminate dust at the source. In situations where dust is a problem, monitoring will be necessary to measure worker exposure to crystalline silica to determine appropriate methods for controlling exposure. Control can be as simple as wetting the dust with a water hose before it becomes airborne or as detailed as a comprehensive Written Exposure Control Plan.

For more information and training materials visit the NIOSH website or the OSHA website. To download a copy of 29 CFR 1926.1153 visits the OSHA website.