

# OSHA Issues Crystalline Silica Rule

## Clean Air for Jobsite Safety



All contractors have to be aware of the increased importance of dust suppression in the work place. Not only is it becoming an important discussion in the construction industry because of stricter regulations, but it has benefits that go beyond health and safety. In recent years, the concrete industry has seen an increased emphasis on concrete dust suppression and containment, both for worker safety and job-site cleanliness. On March 24th, 2016 OSHA issued a final ruling intended to limit exposure for Construction and General Industry to respirable Crystalline Silica.

Exposure occurs during many different construction activities. The most severe exposures generally occur during abrasive blasting with sand to remove paint and rust from bridges, tanks, concrete structures, and other surfaces. Many other construction activities beyond the typical concrete grinding, jack hammering, drilling, coring, concrete mixing, brick and concrete block cutting, sawing, and tuck pointing, add to the hazardous air quality.

To understand what we are dealing with, there are many reports on the hazards of concrete dust. Crystalline silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two other forms of crystalline silica. All three forms may become respirable sized particles when workers chip, cut, drill, or grind objects that contain crystalline silica. About 1.7 million workers in the United States each year are exposed to silica dust and run the risk of developing silicosis, lung cancer, and other debilitating diseases. Public health experts estimate that 280 workers die each year from silicosis as a result of workplace exposures. Crystalline silica has been classified as a human lung carcinogen and silica exposure remains a serious threat to nearly 2 million U.S. workers, including more than 100,000 workers in high risk jobs such as abrasive blasting, foundry work, concrete, rock and stone cutting, coring and drilling, quarry work and tunneling. Breathing crystalline silica dust can cause silicosis, which in severe cases can be disabling or even fatal. The respirable silica dust enters the lungs and causes the formation of scar tissue, thus reducing the lungs' ability to take in oxygen. There is no cure for silicosis. Since silicosis affects lung function, it makes one more susceptible to lung infections like tuberculosis.

The OSHA (Occupational Safety and Health Administration) final ruling has several **key provisions**:

- Reduces the permissible exposure limit (PEL) for respirable crystalline silica from the previous rule by 80% to 50 micrograms per cubic meter of air, averaged over an 8-hour shift.
- Employers will be required to use engineering controls

(such as water, ventilation, and collection) to limit worker exposure; provide respirators when engineering controls cannot adequately limit exposure.

- 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.

Standards contained in the final ruling for the construction industry will take effect on **June 23rd, 2016**, with compliance enforced beginning one year following the effective date. Employers can either use a control methods that reduce the exposure below the PEL by following an OSHA specified combination of engineering controls and respiratory protection, or measure workers' exposure to silica independently and decide which controls work best to limit exposures to the PEL in their workplaces. Regardless of which control method is used, all construction employers covered by the standard are required to:

- Establish and implement a **written exposure plan**
- Designate a **competent person** to implement the plan
- Restrict **housekeeping** practices that expose workers to silica
- Offer **medical exams** every three years for workers who wear a respirator 30 or more days per year
- **Train workers** on operations that result in silica exposure
- **Keep records** of workers' silica exposure and medical exams.

OSHA specifies that an employer must "Implement the best possible permanent solution" for reducing and/or eliminating crystalline silica dust. When silica exposure cannot be eliminated, OSHA suggest methods in controlling silica exposure when grinding, cutting, coring etc., and the fastest growing method is through mechanical means such as vacuums connected to the equipment. Also using water connected to equipment works but the slurry created is then also hazardous and cannot be easily disposed of.

**Some of OSHA's recommendations for what employers and employees can do to protect against exposures to crystalline silica are as follows:**

- Replace crystalline silica materials with safer substitutes whenever possible.

- Provide engineering or administrative controls, where feasible, such as local exhaust ventilation, and blasting cabinets. Where necessary to reduce exposures below the PEL, use protective equipment or other protective measures.
- **Installing dust collection systems** on to machines or equipment that generates dust.
- Use all available work practices to control dust exposures, such as **water sprays**.
- Wear only a **N95 NIOSH certified respirator**, if respirator protection is required. Do not alter the respirator. Do not wear a tight-fitting respirator with a beard or mustache that prevents a good seal between the respirator and the face.
- Wear only a Type CE abrasive-blast supplied air respirator for abrasive blasting.
- Wear disposable or washable work clothes and shower if facilities are available. **Vacuum** the dust from your clothes or change into clean clothing before leaving the work site.
- Check filters, hoses, shrouds and connectors when using dust control equipment to capture all particles from escaping.
- Participate in training, exposure monitoring, and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposures.
- Be aware of the operations and job tasks crating crystalline silica exposures in your workplace environment and know how to protect yourself.
- Use of water attached to equipment to control dust.
- Be aware of the health hazards related to exposure to crystalline silica. Smoking adds to the lung damage caused by silica exposures.
- Do not eat, drink, smoke, or apply cosmetics in areas where crystalline silica dust is present. Wash your hands and face outside of dusty areas before performing any of these activities.

It will become essential for the contractor to outfit tools and equipment with dust containment devices, like shrouds and vacuums, as well as, to control airborne particles with dust barriers and air scrubbers. Manufacturers of equipment in the concrete, masonry and stone industries are starting to respond by incorporating dust suppression systems into their equipment, such as adding larger or multiple ports, and lower profile baffles, which allow air flow (CFM) and lift from a connected vacuum to be concentrated closer to the material. "Having vacuums connected to equipment collecting dust when working is key! Not only is the vacuum's CFM and water lift important, but the type of filter is crucial to collecting the smallest most harmful particles from the air. All vacuums should be outfitted with HEPA (high efficiency particulate air) filters that are at least

99.95% efficient at .5 microns, but we see this rate being reduced. Why would you let the most harmful particles escape? That's why filters rated at 99.99% at .3 microns that are certified and tested are the norm in other parts of the world. Also, collecting the airborne dust with air scrubbers and vacuuming up the remaining dust and debris off the floor instead of sweeping not only controls air quality but also saves the contractor time and labor", states Fredrik Akermark, VP Sales and Marketing, Pullman Ermator North America.

#### **When selecting a vacuum, the contractor needs to look for the following features:**

- High quality HEPA filters, that are tested and certified.
- Multi levels of filtration that include pre filters and pre separators for larger equipment
- Contained filter cleaning so as not to allow dust to escape when cleaning.
- Proper Cubic Feet/Minute (CFM) and water lift for the tool its being attached to.
- Accessory availability to install on the tool for collection at the source and floor tools for clean-up.
- "Auto tool trigger" features so as soon as the tools starts the dust control is activated.
- Wet and dry availability when needed based on job site conditions.
- Control of dust when changing bags with drop down systems.

In a lot of cases contractors and manufacturers are resistant to more regulation. Remember "Time is Money". Looking only at upfront cost, and not at the long term savings and advantages can be shortsighted. Typical wet/dry vacuums are not equipped to handle a variety of mediums and do not prevent the dust from escaping back into the air. With the right equipment, dust barriers, PPE, and the right vacuum on site, labor costs can be reduced by fast and easy clean-up of the job site, not to mention the health benefits to their employees and other workers on the site.

-Excerpted & edited from "Clean Air for Job Site Safety" by Lyndon Kelsey. Details on the new OSHA ruling can be accessed at [osha.gov/silica](http://osha.gov/silica)

