

OSHA Silica Dust Regulations Compliance

| Key Points

- Silica dust is used in a variety of construction applications, and without proper jobsite precautions, it can be dangerous when inhaled.
- Diseases like silicosis, tuberculosis, and lung cancer have all been tied to long-term silica dust exposure.
- New OSHA regulations have updated silica dust permissible exposure limits (PELs) to 50 micrograms per cubic feet of air.
- Industry best practices, including an investment in specialized tools and equipment, can help employers to protect workers and mitigate safety risks.

| Overview

Each year, workplace illnesses claim the lives of thousands of U.S. workers, and respirable crystalline silica – or silica dust – is especially hazardous. Employees who inhale tiny crystalline silica particles are at risk of developing serious diseases, some of which may be deadly. While simply being near silica-containing materials is not hazardous, when job site activities cause the release of a breathable dust, dangerous situations may result. By following new OSHA standards and using the right silica dust control systems, employers can keep their workers safe from the hazards of crystalline silica.

What is Crystalline Silica?

Crystalline silica is a mineral found in many naturally-occurring materials, and it is often used at construction sites and to manufacture industrial products. While materials like soil, sand, mortar, and concrete are best known for containing crystalline silica, there are many other materials that can pose a hazard:

- Asphalt
- Brick
- Cement
- Drywall
- Fiber Cement Products
- Grout
- Guniting/Shotcrete
- Paints Containing Silica
- Plaster
- Rock
- Roof Tile
- Stone (including granite, limestone, quartzite, sandstone, shale, slate, cultured, etc.)
- Stucco/EIFS
- Terrazzo
- Tile (Clay and Ceramic)

Crystalline silica is created during dust generating operations such as sawing, cutting, mixing, surface grinding/scraping and drilling the aforementioned materials. The wide versatility of crystalline silica makes it a hazard within many construction and manufacturing industries:

- General construction
- Glass manufacturing
- Dental laboratories
- Jewelry production
- Ready-mix concrete
- Maritime operations
- Foundries
- Refractory products
- Concrete
- Gas and oil operations

The Dangers of Crystalline Silica

Silica dust has been classified as a human carcinogen, and breathing it can lead to several health issues:

- **Silicosis.** When respirable silica dust enters into the lungs, it can cause scar tissue to form. This reduces the ability of the lungs to take in oxygen. Currently there is no cure for the condition, and in severe cases, silicosis can be fatal.
- **Tuberculosis.** When lung function is affected by conditions like silicosis, a worker will be more susceptible to developing tuberculosis and other lung infections. This infectious disease may be resistant to treatment, and the infection can spread to other parts of the body via the bloodstream.
- **Lung cancer.** A 2013 study completed at Emory University found consistent and strong evidence that silica exposure will increase the risk of lung cancer.
- **Kidney disease.** including end-stage renal disease and nephritis – and non-malignant respiratory diseases like chronic bronchitis are also real dangers.

| OSHA Regulations and Crystalline Silica

OSHA regulations for silica permissible exposure limits (PELs) date back to the 1960s, but until recently, those standards were declared outdated, inconsistent, and failed to properly protect worker health. Since the establishment of the initial guidelines, government organizations like the U.S. National Toxicology Program, the National Institute for Occupational Safety and Health, and the International Agency for Research on Cancer have independently identified crystalline silica as a dangerous carcinogen. These developments led to new, revised rules that will help to reduce the risk of disease among workers who are exposed to and inhale crystalline silica.

| Permissible Exposure Limits

New OSHA guidelines have established a revised PEL limit to worker silica dust exposure. Now, that limit is set at 50 micrograms per cubic feet of air, which is averaged over an eight-hour work day. This level will be the same for all workplaces covered by the standard, and it includes both construction industry and general/maritime industry worksites.

| Construction Industry Regulations

OSHA's [crystalline silica standard](#) for the construction industry requires employers to limit worker exposure to silica dust, and it provides flexible alternatives to accommodate small employers. Employers should either use a [silica dust control method as indicated within this table](#) within the construction standard, or they can measure silica exposure and make an independent decision as to the dust control measures that will work best in their workplace.

Regardless of the exposure control method that is selected, construction employers that are covered by the standard will all be required to:

- **Create and implement a written exposure control plan.** This plan must identify tasks that will involve silica dust exposure and the methods that will be used to protect workers. It should include restriction procedures to limit access to areas deemed as high exposure risks.
- **Identify a plan leader.** Each employer should designate one competent person to be responsible for written plan implementation.
- **Develop housekeeping restrictions.** Housekeeping practices that may expose workers to silica dust must be restricted, especially when other alternatives are available. For example, workers should never clean up silica-containing areas with compressed air or dry brushes, and any vacuum equipment used should have a minimum 99.00% efficiency rating. Under OSHA's silica dust regulation, standard dust collection vacuums are required to have a 99.00% filtration efficiency and HEPA vacuums are required to have a 99.97% filtration efficiency. Workers should also have access to large washbasins and proper toiletries needed to clean up after a day's work.

- **Offer medical examinations.** Workers who are required to wear a respirator at least 30 days per year should be offered a medical exam every three years. These exams will include lung function tests and chest X-rays.
- **Implement proper training.** All workers should be trained in operations that lead to silica exposure and best practices to limit exposure.
- **Maintain records.** Employers are required to keep accurate records of worker silica exposure and medical exam dates.

Construction employers are required to observe all standard dust compliance requirements by September 23, 2017. Laboratory evaluation of exposure sample requirements will begin on September 23, 2018.

| General Industry and Maritime Regulations

OSHA estimates that more than 100,000 general industry and maritime workers are exposed to silica dust levels that exceed the new PEL. The new standard requires employers in this industry to adopt several practices:

- **Measure silica exposure.** Employers will need to measure the amount of silica that workers are exposed to if it is at an action level greater than 25 micrograms per cubic meter of air. If silica exposures are above the PEL of 50 micrograms per cubic meter, proper protective measures must be taken.
- **Limit high-risk access.** Workers should have limited access to areas with silica dust exposures above the PEL.
- **Dust control and respirators.** Dust controls and silica dust collection systems should be used to protect workers from silica exposures that exceed the PEL. When PEL exposure cannot be limited, respirators need to be provided.
- **Develop housekeeping restrictions.** Housekeeping practices that may expose workers to silica dust must be restricted, especially when other alternatives are available.
- **Create and implement a written exposure control plan.** Similar to the construction industry, the plan must identify tasks that will involve silica dust exposure and the methods that will be used to protect workers. It must include restriction procedures to limit access to areas deemed as high exposure risks.

Just like the construction industry regulations, medical exam, training, and record requirements also apply to the general industry and maritime standard. Employers must comply with all of these requirements by September 23, 2018, although some exceptions are available for medical surveillance and hydraulic fracturing operations within the gas and oil industry.

Industry Best Practices: Meet OSHA Regulations and Help Prevent Silica-Related Health Issues

There are a variety of steps that employers can take to meet OSHA regulations and prevent the hazards of silica dust, including the use of [specialized silica dust control tools and equipment](#):

- Provide administrative and engineering controls, where feasible. This includes blasting cabinets and local exhaust ventilation. If required to reduce exposure below PEL, employers can use silica dust collection systems and should use protective equipment.
- Invest in appropriate dust collectors. OSHA regulations require that dust collectors provide airflow at or above that recommended by the tool manufacturer, and contain a filter with 99.00% or greater efficiency. At CS Unitec, our standard vacuums offer an efficiency of 99.73%, while our HEPA vacuums have a 99.99% efficiency rating, both of which are higher than the 99.00% OSHA requirement for temporary construction jobs.
- Replace crystalline silica materials with a safer alternative, when possible.
- Use any available dust suppression methods, including the use of water sprays.
- If a respirator is required, only use a N95 NIOSH certified respirator. These should not be altered, and staff should be clean-shaven in order to create the proper seal between the face and the device.
- For abrasive blasting, only Type CE abrasive-blast supplied-air respirators should be used.
- Implement and participate in exposure monitoring, training, and health screenings to monitor for adverse health effects that could result from silica dust exposure.
- Be aware of the crystalline silica exposure hazards, and remember that smoking will add to the damage caused by exposure.

From industrial silica dust collection systems to vacuum-connected power tools, the right controls will be essential for both OSHA compliance and worker safety.

OSHA recognizes that most employers want to prioritize employee safety and protect workers from job-site hazards. From website publications to a trained Compliance Assistance Specialist, the agency will work with small businesses to ensure compliance with these new crystalline silica standards.

For reference, The Center for Construction Research and Training has put together a helpful [“Create-A-Plan to Control the Dust”](#) program that will walk contractors and other jobsite safety personnel through the steps to create a written exposure control plan and protect workers employed in silica dust-creating jobsites.

Our Dust Collection Vacuums

Vacuum removal is the most effective method of controlling silica dust created by power tools. CS Unitec's standard vacuums are 99.93% efficient, while our high-efficiency particulate air (HEPA) vacuums are 99.99% efficient – both well above OSHA mandates. Our system places the shroud and vacuum hose adjacent to the tool's bit or blade, ensuring the silica dust is collected at the source, before it becomes airborne. All of the CS Unitec dust collection vacuums come with several features that make construction jobs more safe and effective:

- CS Unitec's exclusive Electromagnetic Pulse Filter Cleaning System vibrates the filters to remove dust, maximizing suction and doubling filter life. This feature can be activated manually and can also start automatically without interruption when the vacuum detects reduced suction power.
- Wet vacuuming capabilities.
- Built-in power take-off sockets. Shutting off the power tool also cuts power to the vacuums – after a delay to ensure all dust is extracted from the hose.
- Fifteen-foot vacuum hoses and twenty-six-foot power cords for ultimate portability and maneuverability.
- High-capacity tanks. Size varies by model.

CS Unitec also offers a variety of concrete and masonry tools with dust extraction for sawing, drilling, surface prepping and drilling applications. Using these power tools with our efficient vacuum systems to collect silica dust at the source offers additional protection to the operator. It is each company's responsibility to follow all OSHA, state and local safety regulations regarding the choice, operation and maintenance of power tools and dust collection/suppression systems. This includes tools and systems used when working with materials containing crystalline silica. For more information about OSHA's silica dust collection guidelines and regulations, visit the links below:

- [Silica Construction Regulations](#)
- [OSHA Regulations](#)
- [Work Safely with Silica](#)

About CS Unitec

CS Unitec, Inc. specializes in industrial power tools and safety tools for construction and industry. Innovation and high quality are synonymous with CS Unitec's power tools. In 1991, the company invented the first pneumatic portable band saw. CS Unitec has added to its list of industry firsts with the widest range of portable magnetic drills and hand-held concrete core drills. The line also includes surface preparation tools for metal, concrete and masonry, air, electric and hydraulic portable band saws, reciprocating saws, hack saws, nut runners, rotary hammer drills, rolling motors, non-sparking safety tools, portable mixers and dust extraction vacuum systems.

Call CS Unitec today at 888-628-9083 to discuss your silica dust containment needs.