

## FACT SHEET

# OSHA Lowers Respirable Crystalline Silica Permissible Exposure Limit

## Final rule features new employee protection measures

The federal Occupational Health and Safety Administration (OSHA) has adopted a long-awaited [final rule](#) on *Occupational Exposure to Respirable Crystalline Silica*.



The new rule is written as two standards: one for [construction](#) and the other for [general industry and maritime](#). It reduces current permissible exposure limits (PEL) to 50 micrograms per cubic meter of air, averaged over an eight-hour shift, for all applicable industries.

The new PEL is significant: It is five times lower than the existing limit for construction (250 micrograms) and half of the existing limit for general industry (100 micrograms). In addition, affected employers will be required to implement a series of protective measures that were not previously mandated.

OSHA standards relative to the control of exposures to respirable crystalline silica have long been considered woefully out of date. OSHA first adopted standards in 1971 as one of 425 PELs for air contaminants. Since then, applicable PELs have been rendered obsolete by advances in sampling methods.

OSHA estimates about a third of the approximately 295,000 workers in general industry and maritime workplaces are exposed to respirable crystalline silica at levels above the new PEL. Similarly, among 2 million construction workers, about 840,000 are exposed to dust containing silica particles at levels exceeding the newly established limit.

### Enforcement Dates

The rule takes effect June 23, 2016. Staggered enforcement dates will be used to give employers time to adapt work practices:

- Construction—June 23, 2017, with two additional years to comply with required sample-analysis methods
- General industry and maritime—June 23, 2018
- Companies engaged in hydraulic fracturing—June 23, 2018; engineering controls for hydraulic fracturing will go into effect June 23, 2021

States with their own health and safety enforcement agencies have six months to adopt similar standards.

### Requirements

Under the new rule, employers are required to:

1. Use engineering controls (such as water, vacuuming or ventilation) and other work practices to limit worker exposure.
2. Provide respirators when engineering controls do not provide adequate protection.
3. Limit worker access to high-exposure areas.

4. Train workers on exposure risks and protection.
5. Provide medical exams to monitor the health of highly exposed workers and provide information about lung health.
6. Develop a written exposure control plan that describes methods used to identify and control workplace exposures.

The construction standard requires a “competent person” to be assigned to implement the plan. (For related information, refer to the American Industrial Hygiene Association’s white paper on [Recommended Skills and Capabilities for Silica Competent Persons](#).) In addition, construction employers may use a control method contained in the construction standard (refer to Table 1 in the standard) or take action to measure workers’ exposure and independently decide which controls would most effectively limit exposure.

Table 1 matches common construction tasks with recommended dust control methods. Employers who correctly follow recommendations are not required to measure workers’ exposure to silica and are not subject to the PEL. Employers who opt to develop their own methods must: 1) measure the amount of silica to which workers are exposed if levels may be at or above 25 micrograms averaged over an eight-hour shift, and 2) implement dust controls to protect workers from exposures above the PEL.

## Health Effects



Silica refers to the compound silicon dioxide ( $\text{SiO}_2$ ). It is a major component of sand, rock and mineral ores. Exposure to fine particles is associated with serious and potentially fatal health

effects including silicosis, lung cancer, chronic obstructive pulmonary disease and activation

of latent TB infection, which is considered a public health risk.

Exposure to respirable crystalline silica occurs in industry settings such as foundries, abrasive blasting operations, and manufacturing of paint, glass, brick, concrete products, china, pottery and plumbing fixtures. Construction activities with exposure risks include highway repair, masonry, concrete work, rock drilling and tuck-pointing. In relatively recent studies, hydraulic fracturing and countertop manufacturing, finishing and installation have been identified as exposure sources.

## Exceptions

The standards does not apply when worker exposures to respirable crystalline silica are expected to remain below  $25 \mu\text{g}/\text{m}^3$  as an 8-hour time-weighted average (TWA). Employers in general industry and maritime must be prepared to provide supporting evidence.

Other exceptions include:

- Protective clothing will not be required in certain situations.
- Use of compressed air, dry sweeping and dry brushing to clean contaminated clothing or surfaces will be allowed if other cleaning methods are not feasible.
- The standard for general industry and maritime allows employers to comply with specific exposure control methods in the standard for construction (Table 1) instead of complying with the applicable PEL under certain circumstances.
- The standard for general industry and maritime does not apply to exposures that result from the processing of sorptive clays.

## Medical Surveillance

Under both standards, employers must provide medical exams every three years for workers exposed **above the PEL** for 30 or more days per year.

Physicians and other medical professionals who manage medical surveillance programs are expected to have a thorough understanding of silica-related diseases and health effects. Required exam components include:

- Medical and work history, with an emphasis on past, present and anticipated exposures
- Physical examination at baseline and every three years thereafter
- TB testing
- Pulmonary function testing administered by a NIOSH-certified spirometry technician
- Chest X-ray

Additional optional tests may be performed on a case-by-case basis. The examiner must explain results to the examinee and provide a written medical report within 30 days. The report must identify any medical condition(s) that would place the employee at increased risk of material impairment to health and any medical conditions that require further evaluation or treatment. The report must include recommended limitations on exposures and respirator use.

For detailed medical exam requirements, contact WorkCare or refer to [Appendix B to 1926.1153 – Medical Surveillance Guidelines](#).

## Control Measures

With respect to [control measures](#), where possible, OSHA recommends eliminating or substituting silica with a safer option. When removal is not feasible, engineering controls



such as local exhaust ventilation, containment methods (e.g., blast-cleaning machines and cabinets), and wet sawing or wet drilling of silica-containing materials are recommended.

Administrative or work practice controls such as limiting exposure time and requiring workers to shower and change into clean clothes before leaving a worksite may be acceptable in some instances.

According to OSHA, personal protective equipment is the least desirable option, but may still help keep levels below the PEL.

## Anticipated Outcomes

OSHA estimates the new rule, once fully implemented, will save more than 600 lives and prevent 900 new cases of silicosis a year. The agency estimates average annual compliance costs will be \$1,500 per employer and less than \$600 for small firms. The annual estimated \$1 billion cost to industry is projected by OSHA to be offset by net benefits of about \$7.7 billion. The National Association of Manufacturers, among other industry groups, has suggested costs are underestimated and are likely to be onerous for some companies.

While some stakeholder groups favored adoption of a single standard, OSHA determined that dual standards would help provide equivalent protection for workers while accounting for different work activities, anticipated exposures and other industry-specific conditions. Changes OSHA ultimately made in the rule between draft and final versions include giving employers more flexibility in how they reduce exposure levels while maintaining or improving worker protection.