



# about CRYSTALLINE SILICA

**OSHA estimates that around 2.3 million workers are exposed to crystalline silica on the job.**

Crystalline silica is a common mineral found in many naturally occurring materials and used in many industrial products and at construction sites. Materials like sand, concrete, stone and mortar contain crystalline silica.

Crystalline silica is also used to make products such as glass, pottery, ceramics, bricks, concrete & artificial stone. Industrial sand used in certain operations, such as foundry work and hydraulic fracturing (fracking), is also a source of crystalline silica exposure. Amorphous silica, such as silica gel, is not crystalline silica.

Simply being near sand or other silica-containing materials is not hazardous. The hazard exists when specific activities create respirable dust that is released into the air. Inhaling very small (“respirable”) crystalline silica particles, causes multiple diseases, including silicosis, an incurable lung disease that can lead to disability and death. Respirable crystalline silica also causes lung cancer, chronic obstructive pulmonary disease (COPD), and kidney disease.



# What regulations exist to manage silica dust risks?

## **The federal Occupational Safety & Health Administration (OSHA) administers regulations for crystalline silica.**

OSHA requires employers to develop a written Exposure Control Plan and to provide monitoring to determine exposures of employees that work in and around environments that might produce airborne crystalline silica.

Recent revisions to the OSHA Silica in Construction regulations added a new set of requirements, known as Table 1, which establishes engineering controls, work practices, and respiratory protection for a full range of construction tasks.

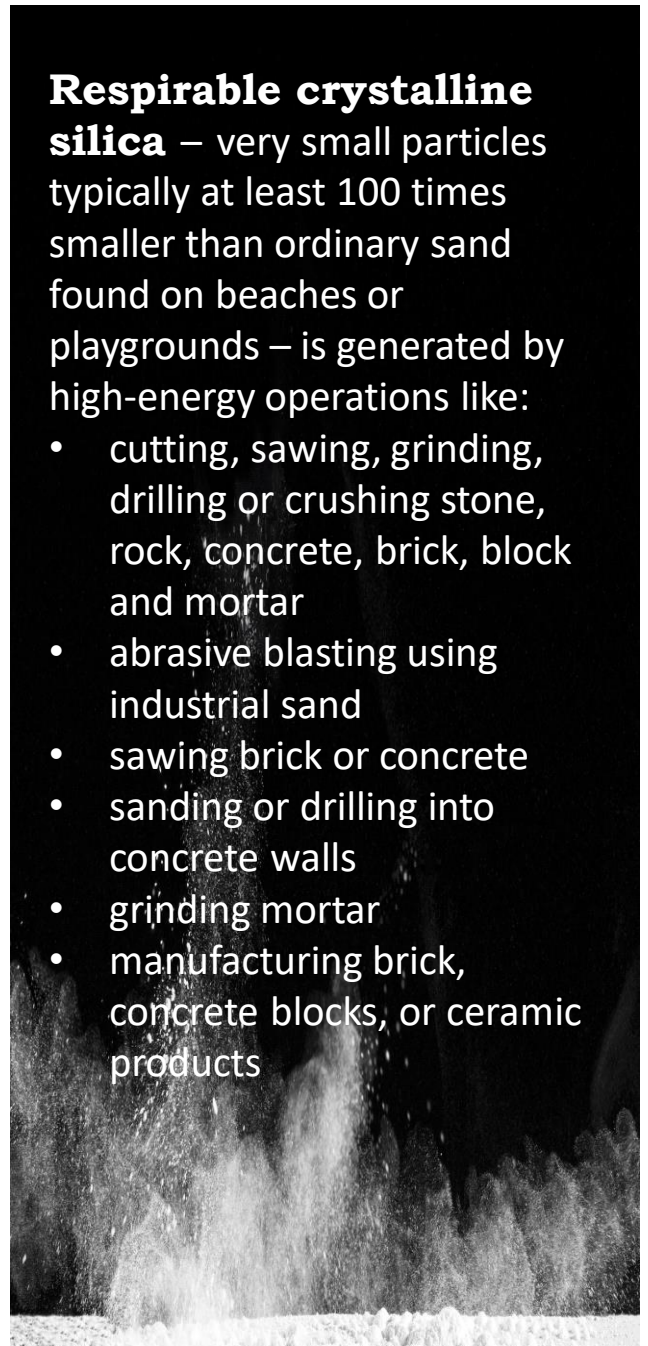
If an employer uses the controls and practices outlined in Table 1, there is no requirement for monitoring dust levels and the exposures are deemed to be below the PEL.

Construction firms must provide OSHA with a Written Exposure Control Plan, but that's it!!!

## **Respirable crystalline silica**

– very small particles typically at least 100 times smaller than ordinary sand found on beaches or playgrounds – is generated by high-energy operations like:

- cutting, sawing, grinding, drilling or crushing stone, rock, concrete, brick, block and mortar
- abrasive blasting using industrial sand
- sawing brick or concrete
- sanding or drilling into concrete walls
- grinding mortar
- manufacturing brick, concrete blocks, or ceramic products





# Why did OSHA issue a new crystalline silica rule?

**OSHA's previous permissible exposure limits (PELs) for silica were outdated, inconsistent and did not adequately protect worker health.**

Agency for Research on Cancer, and the National Institute for Occupational Safety & Health have all identified respirable crystalline silica as a human carcinogen. Previous construction and shipyard PELs were based on an old method of measuring worker exposures to silica that is not used today. Those previous limits are inconsistent, allowing permissible levels for construction and shipyards to be more than twice as high as levels in general industry.

OSHA's revised rule reduces the risk of disease among workers who inhale respirable crystalline silica and provide the same protection for all workers covered. New PEL limits worker exposures to 50 micrograms of respirable crystalline silica per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ), averaged over an eight-hour day. This level is the same for all workplaces covered by the standard (general industry/maritime and construction) and is roughly 50% percent of the previously allowed PEL for general industry, and roughly 20% of the previous PEL for construction and shipyards.

The previous PELs were based on studies from the 1960s (and earlier) that did not reflect more recent scientific evidence showing that low-level exposures to silica cause serious health effects, including lung cancer.

In the 45 years since the previous PELs were established, the U.S. National Toxicology Program, the International



# How will the crystalline silica rule protect workers' health?

The new rule requires that employers use engineering controls – such as ventilation and wet methods for cutting and sawing crystalline silica-containing materials – to reduce workers' exposure to silica dust. Once the full effects of the rule are realized, OSHA expects it to prevent 600 deaths a year from silica-related diseases – such as silicosis, lung cancer, other respiratory diseases and kidney disease – and to prevent more than 900 new cases of silicosis each year.

## **Affected Industries include:**

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Construction	Refractory products
Glass manufacturing	Landscaping
Pottery products	Ready-mix concrete
Structural clay products	Cut stone & stone products
Concrete products	Refractory furnace installation & repair
Foundries	Railroads
Dental laboratories	Hydraulic fracturing for gas & oil
Paints & coatings	Asphalt products manufacturing
Jewelry production	Abrasive blasting in
	- Maritime work
	- Construction
	- General industry

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# How can silica exposures be controlled to keep exposure at or below the PEL?

## **Employers must use engineering controls and work practices as the primary way keep exposures at or below the PEL.**

- **Engineering controls** include wetting down work operations or using local exhaust ventilation (such as vacuums) to keep silica-containing dust out of the air and out of workers' lungs. Another control method that may work well is enclosing an operation ("process isolation").
- **Examples of work practices** to control silica exposures include wetting down dust before sweeping it up or using the water flow rate recommended by the manufacturer for a tool with water controls.
- **Respirators are only required when engineering and work practice controls cannot maintain exposures at or below the PEL.**

For construction, the standard includes Table 1, a list of common construction tasks along with exposure control methods and work practices that work well for those tasks and can be used to comply with the requirements of the standard.



# Table 1: “Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica”

**Table 1 is a flexible compliance option that effectively protects workers from silica exposures.**

It identifies 18 common construction tasks that generate high exposures to respirable crystalline silica and for each task, specifies engineering controls, work practices, and respiratory protection that effectively protect workers. Employers who fully and properly implement the engineering controls, work practices, and respiratory protection specified for a task on Table 1 are not required to measure respirable crystalline silica exposures to verify that levels are at or below the PEL for workers engaged in the Table 1 task.

OSHA developed Table 1 in response to stakeholders in the construction industry, who indicated the need for guidance and a standard that is different than a standard for general industry. Among the concerns of construction industry stakeholders were the impracticality of exposure monitoring based on short duration of task and constantly changing conditions, such as weather, job sites and materials.





# When must employers comply with the standard for general/industry and maritime?

## **Now.**

For **all operations in general industry (INCLUDING CONSTRUCTION) and maritime**, other than hydraulic fracturing operations in the oil and gas industry:

- Employers have been required to comply with all obligations of the standard, since June 2018.
- Employers must offer medical examinations to employees exposed above the PEL for 30 or more days a year.

On June 23, 2020, an additional requirement was activated, mandating employers to offer medical examinations to employees exposed at or above the action level for 30 or more days a year.

For **hydraulic fracturing operations in the oil and gas industry**:

- Employers have been required to comply with all obligations of the standard, except for engineering controls and the action level trigger for medical surveillance, by June 2018.

Engineering controls to limit exposures to the new PEL will be required by June 23, 2021. Until then, employers can continue to have employees wear respirators if their exposures exceed the PEL.



# Will states with OSHA-approved programs adopt the standards?

## **Yes.**

States with OSHA-approved state plans have adopted standards that are at least as effective as Federal OSHA standards.

Many state plans adopt standards identical to OSHA, but some state plans may have different or more stringent requirements. It's important to know which standards apply to your work.

Employers who fully and properly implement the engineering controls, work practices, and respiratory protection specified for a task on Table 1 are not required to measure respirable crystalline silica exposures to verify that levels are at or below the PEL for workers engaged in the Table 1 task. All employers must develop a written exposure plan to report their control measures.

KEM can assist your firm with compliance with the OSHA regulations regarding crystalline silica. We can provide the Written Exposure Control Plan and any necessary monitoring for your employees.







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