



Hydraulic Fracturing Industry Receives Some Reprieve from OSHA's Respirable Silica Rule

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The U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) published "Occupational Exposure to Respirable Crystalline Silica: Final Rule" on March 25, 2016, establishing two new federal standards, 29 CFR 1926.1153 for construction and 29 CFR 1910.1053 for general industry and maritime.

Under the general industry and maritime standard, most requirements became enforceable on June 23, 2018. Among these, the standard establishes a new eight-hour, time-weighted average permissible exposure limit (PEL) of 50 micrograms of respirable crystalline silica per cubic meter of air ($\mu\text{g}/\text{m}^3$) and an action level (AL) of 25 $\mu\text{g}/\text{m}^3$. It also requires other employee protections, including:

- ✓ performing exposure assessments

- ✓ using exposure control methods
- ✓ using respiratory protection
- ✓ establishing regulated areas
- ✓ developing and implementing a written exposure control plan
- ✓ offering medical surveillance
- ✓ developing hazard communication information
- ✓ keeping silica-related records

While compliance with the rule will present immediate challenges to many, because controls for respirable crystalline silica in the hydraulic fracturing industry are still in development, the rule allows those employers some reprieve.

BACKGROUND

According to OSHA, crystalline silica is a common mineral found in many naturally occurring materials and is used in many industrial products and generated at most construction sites. It is also found in materials like sand,

concrete, stone, and mortar. Industrial sands, such as those used in newer industries like hydraulic fracturing, also contain crystalline silica.

Respirable crystalline silica is very small. The particles are typically 100 times smaller than ordinary beach sand. It is generated through high-energy operations like cutting, sawing, grinding, drilling and crushing stone, rock, concrete, brick, block, and mortar. Or in the case of hydraulic fracturing, when large quantities of silica sand are loaded into sand movers and subsequently transferred via conveyor belt before being blended with fluids and surfactants prior to high pressure injection.

DRIVERS

According to OSHA, inhaling very small (respirable) crystalline silica causes multiple diseases, including silicosis, an incurable lung disease that

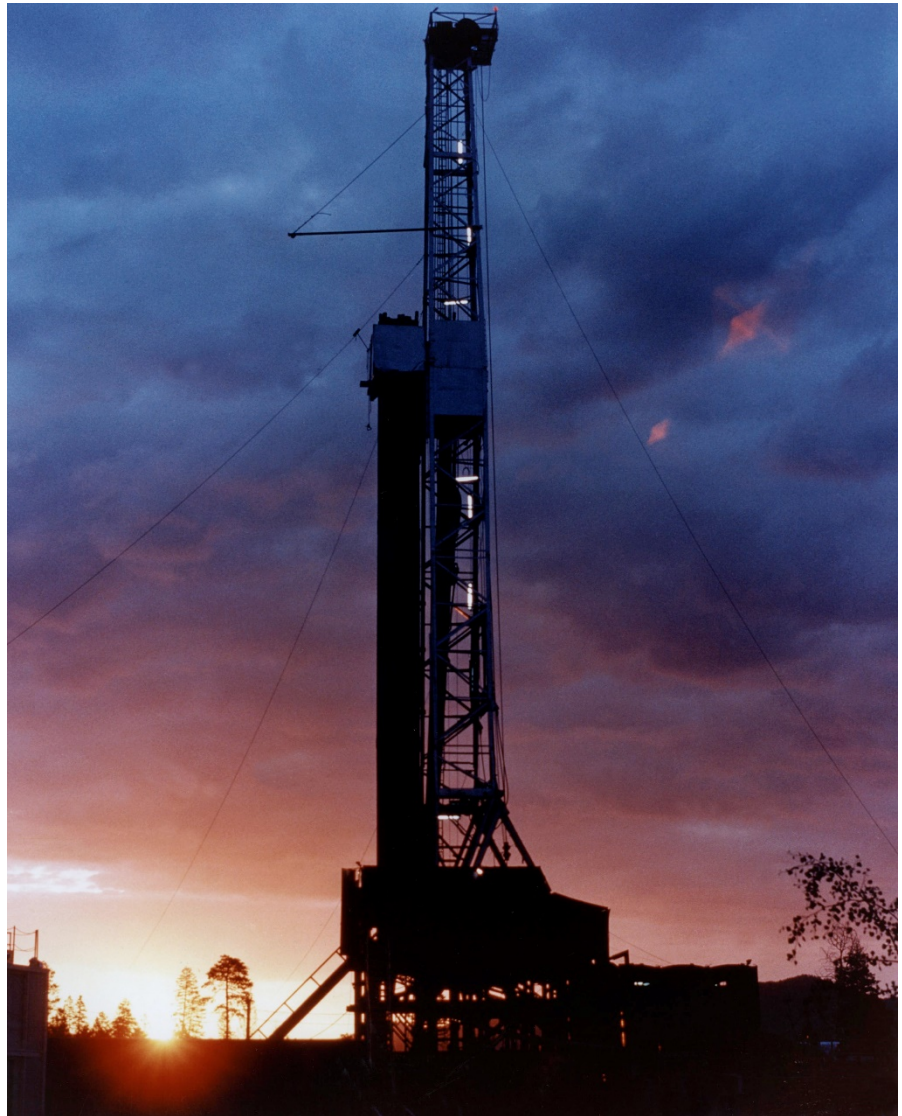
can lead to disability and death. Respirable crystalline silica has also been shown to cause lung cancer, chronic obstructive pulmonary disease, and kidney disease.

While the number of silicosis cases has declined over the past several decades, it is still a serious workplace health problem. To support their position, OSHA notes prior exposure limits and protective measures were based on older studies from the 1960s and earlier, which did not reflect more recent scientific evidence showing low-level exposure to silica causes serious health effects, including lung cancer.

OSHA underscores the significance of the issue by citing a Bureau of Labor Statistics report of fatal occupational injuries, “In fact, more workers died from silicosis in 2014 than in fires, or from being caught in or crushed by collapsing materials, such as in trench and structure collapses.”¹ Accordingly, OSHA suggests that unless action is taken to reduce workers’ exposure to silica dust, new cases of silicosis could increase, especially as more workers are being exposed to respirable crystalline silica in some newer industries such as hydraulic fracturing.

THE NEW STANDARD

The new standard places the AL, or level below which an employer may claim exclusion from the standard, at 25 $\mu\text{g}/\text{m}^3$. It also requires 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 to no more than 50 $\mu\text{g}/\text{m}^3$, averaged over an eight-hour day. This level is the same for all workplaces covered by the standard (general industry, which includes hydraulic fracturing operations, maritime, and construction), and is roughly 50 percent of the previous PEL for general industry, and roughly 20 percent of the previous PEL for construction and shipyards.



While OSHA freely admits it finds significant risk remaining even at the new PEL - one that the National Institute for Occupational Safety and Health (NIOSH) first recommended more than 40 years ago - it considers a PEL of 50 $\mu\text{g}/\text{m}^3$ to be the lowest level that can reasonably be achieved through use of engineering controls and work practices in most affected operations.

The standard mandates employers use engineering controls to keep exposure at or below the PEL. These include wetting down work operations or using local exhaust ventilation to keep silica-containing dust out of the air. Another control method includes process isolation; enclosing an operation in a

manner that contains silica dust and prevents it from entering the respirable airspace. 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.

A REPRIEVE

While hydraulic fracturing employers are required to comply with all other obligations of the standard by June 23, 2018, because controls for respirable crystalline silica in hydraulic fracturing are still in development, the rule allows hydraulic fracturing employers additional time to implement engineering controls to take advantage of emerging technologies.² That is,

unlike most general industry and maritime employers, hydraulic fracturing employers do not have to implement engineering controls to limit exposures to the new PEL until June 23, 2021; three years after other general industry and maritime employers. According to OSHA, from June 23, 2018, to June 23, 2021, hydraulic fracturing employers can continue to have employees use respirators when exposures exceed the PEL.³

REDUCING WORKER EXPOSURE TODAY

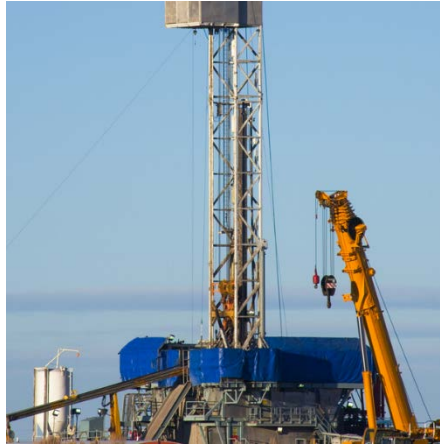
In early 2012, NIOSH reported workers may be exposed to dust with high levels of respirable crystalline silica during some hydraulic fracturing operations. In addition to identifying seven primary sources where dust could be released, they also outlined the following work practices that could be employed to reduce the amount of silica dust during hydraulic fracturing operations:

Work practices that can be used now:

- Cap unused fill ports on sides of sand mover.
- Reduce distance sand falls (e.g., between the end of the dragon's tail and T-belts).
- Limit the number of workers and the time workers must spend in areas where silica dust is in the air.
- Consider modifications to equipment so dusty operations can be performed remotely.
- Apply water-based products to roads and around the well site to reduce the amount of airborne dust.

Work practices that involve equipment modification:

- Enclose points where dust is released (e.g., skirting around bottom sides of sand movers, shrouding around and at the end of the dragon's tail).
- Use door seals and HEPA filtration on enclosed operator cabs or booths where possible.



- Use local exhaust ventilation on machines or equipment to collect dust.
- Replace transfer belts with screw augers on sand movers in new designs or retrofits.

LEGAL CHALLENGES

In December 2017 the U.S. Court of Appeals for the Washington, D.C. Circuit found OSHA offered enough evidence to justify its regulation of silica in the workplace despite legal challenges from industry groups, including the U.S. Chamber of Commerce. The panel of federal judges also said OSHA was entitled to make decisions using studies resulting in better worker protections and only had to prove the typical company had a reasonable possibility of being able to institute the necessary engineering and other controls necessary to limit exposure.

With respect to hydraulic fracturing, the court held that “even if sufficient controls do not yet exist” to reduce exposures below the PEL in that industry, “OSHA can force industry to develop and diffuse new technology to meet its standard,” effectively supporting the exception in the rule pertaining to hydraulic fracturing and noting “OSHA [has] identified controls, some currently available and others under development, that promise to sufficiently reduce exposure.” (OSHA, NIOSH, and several U.S. onshore exploration and production industry trade associations,

companies, and individual experts had formed a Respirable Silica Focus Group to further explore silica exposure during hydraulic fracturing and to develop practical short- and long-term solutions to protect worker safety and health.)

CONCLUSION

Because the court rejected the industry challenges to the Silica Rule in their entirety, the rule remains in effect. This means most general industry and maritime employers are required to comply with the standard by June 23, 2018. However, because controls for respirable crystalline silica in hydraulic fracturing are still in development, the rule allows hydraulic fracturing employers additional time to implement engineering controls to take advantage of emerging technologies. That is, hydraulic fracturing employers do not have to implement engineering controls to limit exposures to the new PEL until June 23, 2021. They are, however, required to comply with all other obligations of the standard by June 23, 2018.

References:

1. Bureau of Labor Statistics (2014). Fatal occupational injuries by event or exposure for all fatal injuries and major private industrial sector, all United States, 2014. <http://www.bls.gov/iif/oshwc/cfoi/cftb0294.pdf>
2. The medical surveillance requirement for hydraulic fracturing employees exposed at or above the AL for 30 or more days a year was also extended to June 23, 2020.
3. When respirators are required, an employer must have a respiratory protection program that meets the requirements of OSHA's Respiratory Protection standard (29 CFR 1910.134). This program must include proper respirator selection, fit testing, medical evaluations, and training. All respirators need to be NIOSH-approved.



Additional information about the silica rule is available at www.osha.gov/silica.

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Table 1 — OSHA'S RESPIRABLE CRYSTALLINE SILICA STANDARD

OSHA'S Respirable Crystalline Silica Standard for general industry and maritime requires employers to limit workers exposure to respirable crystalline silica and to take other steps to protect workers. Among other things, the standard requires employers to:
Assess employee exposures to silica if it may be at or above an action level of 25 µG/M ³ , averaged over an 8-hour day.
Protect workers from respirable crystalline silica exposures above the PEL of 50 µG/M ³ , averaged over an 8-hour day.
Limit workers' access to areas where they could be exposed above the PEL.
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.
Restrict housekeeping practices that expose workers to silica, such as use of compressed air without ventilation system to capture the dust and dry sweeping, where effective, safe alternatives are available.
Establish and implement a written exposure control plan that identifies tasks that involve exposure and methods used to protect workers.
Offer medical exams – including chest X-Rays and lung function tests – every three years for workers exposed at or above the action level for 30 or more days per year.
Train workers on work operations that result in silica exposure and ways to limit exposure.
Keep records of exposure measurements, objective data and medical exams.
General industry and maritime employers must comply with all requirements of the standard by June 23, 2018, except for the following:
Medical surveillance must be offered to employees who will be exposed at or above the action level for 30 or more days a year starting on June 23, 2020. (Medical surveillance must be offered to employees who will be exposed above the PEL for 30 or more days a year starting on June 23, 2018.)
Hydraulic fracturing operations in the oil and gas industry must implement engineering controls to limit exposures to the new PEL by June 23, 2021.
Source: www.osha.gov/Publications/OSHA3682.pdf