



OSHA's final silica regulation

OSHA has issued a final rule regarding worker exposure to crystalline silica

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The Occupational Safety and Health Administration (OSHA) released its final rule on worker exposure to crystalline silica March 25. The rule had been delayed significantly by the review process conducted by the White House Office of Management and Budget, which began its final review Dec. 21, 2015. OSHA noted the rule's initial publication resulted in more than 2,000 public comments supported by more than 34,000 pages of submitted material and commanded 14 days of public hearings.

OSHA claims the final rule will save more than 640 lives and prevent more than 900 new cases of silicosis each year. The agency projects the rule will provide annual net benefits of about \$7.7 billion with annual costs of \$1 billion.

According to OSHA, about 2.3 million workers are exposed to respirable crystalline silica in their workplaces (respirable silica being inhaled particles 10 microns in size or less that can enter critical lung areas and cause health problems). The at-risk workforce includes about 2 million construction workers who drill, cut, crush or grind silica-containing materials such as concrete and stone and 300,000 workers in general industry operations such as brick manufacturing, foundries and hydraulic fracturing.

Silica refers to the chemical compound silicon dioxide (SiO_2); the most common form is quartz. Sand, a key component in many building products such as mortar, clay and concrete tiles, or pavers and brick, mainly is composed of silica in the form of quartz. Hazards develop when materials containing silica are cut, drilled or ground in a way that produces respirable silica. This most often occurs with powered saws or grinders with diamond blades or silicon carbide-cut wheels that produce airborne particles that can be inhaled.

The danger results when the smallest of particles penetrate the gas exchange area of the lungs; larger particles do not travel that deeply into the lungs and are purged by natural bodily actions. Respirable particles remain in the lungs, permanently scar lung tissue and make breathing increasingly more difficult—an occupational disease known as silicosis that often does not manifest itself until many years following exposure.

According to the American Lung Association, silicosis increases the risk of other lung illnesses such as tuberculosis, lung cancer and chronic bronchitis.

OSHA action

OSHA's construction regulation 29 CFR §1926.55 addresses silica as an airborne contaminant under the Mineral Dust Table, and the exposure limit in that regulation was adopted in 1971. However, the formula for determining worker exposure according to the Mineral Dust Table is based on an obsolete sampling method that renders the current regulation ineffective. The agency set about crafting a new regulation for occupational exposure to crystalline silica that first was proposed in September 2013.

The final rule:

- Establishes an action level and a permissible exposure limit (PEL) for worker exposures
- Specifies exposure control methods for construction tasks listed in what OSHA refers to as Table 1 that eliminate the requirement for initial exposure monitoring
- Requires a written exposure control plan
- Requires workers who use a respirator for 30 or more days in one year to be provided with medical surveillance
- Requires silica hazard communication to workers
- Requires use of objective data to assess worker exposure to silica
- Provides a specific compliance date for the construction industry

About 2.3 million workers are exposed to respirable crystalline silica

Action level and PEL

Under the new OSHA rule, an employer must ensure no worker is exposed to a respirable crystalline silica concentration in excess of the PEL of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air calculated as an eight-hour time weighted average. The employer also is obliged to assess the exposure of any worker who is or may reasonably be expected to be exposed to a level of respirable crystalline silica at or above the action level of 25 $\mu\text{g}/\text{m}^3$ of air calculated as an eight-hour time-weighted average.

The new PEL of 50 $\mu\text{g}/\text{m}^3$ reflects a significantly more protective (lower) exposure level than was permitted under the old formulaic calculation that approximated 250 $\mu\text{g}/\text{m}^3$ of air. Air monitoring workers to assess their exposures to respirable crystalline silica likely is the most costly feature of the new regulation. Two elements of the new rule can minimize its administrative burdens and financial

effects: the specified exposure control methods under Table 1 and the provision for objective data.

Table 1

Under 29 CFR §1926.1153(c), OSHA sets out specified exposure control methods for a variety of construction tasks. If an employer implements the engineering controls and respiratory protection listed in Table 1 for a specific task, the employer will be in compliance with the rules for exposure to crystalline silica, and initial exposure monitoring would not be required.

For example, Table 1 requires an integrated water delivery system that continuously feeds water to the blade of a handheld power saw used to cut silica-containing material. For outdoor use of four hours or less, Table 1 does not require the operator to wear a respirator. However, if cutting exceeds four hours, a respirator with an assigned protection factor (APF) of 10 also must be used with the water delivery system.

The National Institute for Occupational Safety and Health (NIOSH) notes in the 2004 Respirator Selection Logic that filtering face-piece respirators (dust masks) are available with an APF of 10 if the filter medium protects against the particulate in question. This is determined by the designation of the filtering face piece as an N, P or R type. N means not resistant to oil particles; R is Resistant to oil; and P is oil-proof. Half-mask or full face mask air-purifying respirators with an APF of at least 10 are suitable alternatives to dust masks but also are cumbersome and restrict visibility.

In NRCA's opinion, the use of water to control dust remains an area of substantial concern for operator safety and will require increased vigilance by contractors to ensure worker safety.

Another Table 1 task listed by OSHA is the use of a handheld grinder for mortar removal to facilitate counterflashing installation, for example. To comply with engineering controls, a grinder must be equipped with a shroud and dust-collection system operated according to the manufacturer's instructions. OSHA specifies the minimum airflow, filter efficiency and type in Table 1. In addition, an operator using a grinder with the described dust-collection attachment must wear a respirator with an APF of 10 when grinding work is performed for four hours or less and a respirator with an APF of 25 when grinding is performed for more than four hours.

NIOSH lists two types of APF 25 respirators in its selection logic: Any powered air-purifying respirator equipped with a hood or helmet and a high-efficiency particulate air filter or any continuous-flow supplied-air respirator equipped with a hood or helmet. Extending the time an operator uses a grinder for mortar joints in excess of four hours triggers required use of more efficient, cumbersome and expensive respirators.

Written exposure control plan

When tasks involve exposure to respirable crystalline silica, contractors must develop a written exposure control plan describing the engineering controls, work practices and respiratory protection

that will be used to protect workers. Contractors also must:

- Describe housekeeping measures that will be used to minimize worker exposure to respirable crystalline silica
- Describe procedures to restrict access to work areas when necessary and to minimize the number of workers exposed and their exposure levels
- Review and evaluate the plan's effectiveness at least annually
- Make the plan available for examination and copying by workers, their representatives and OSHA
- Designate a competent person to inspect job sites, materials and equipment on a frequent basis to implement the plan

Medical surveillance

OSHA's medical surveillance requirement is tied to the days a worker must use a respirator. If respirator use will be required on 30 or more days during a year, a contractor must make sure a number of medical examinations and procedures take place.

For example, an initial examination must include the worker's medical and work histories, a physical exam, chest X-ray, pulmonary function test and tuberculosis test. OSHA requires an initial examination as a baseline evaluation be performed within 30 days after the worker's initial assignment. A contractor must make sure the physician or other licensed health care professional is informed of the worker's duties as they relate to silica exposure, the levels of silica the worker has been or may be exposed to, the type of personal protective equipment used by the worker, and information from employment-related medical exams previously provided to the worker and within the control of the contractor.

A contractor must ensure the worker gets a report from the physician or licensed health care professional within 30 days of the exam and the results of the exam are explained to the worker. The contractor must obtain a medical opinion from the physician or licensed health care professional within 30 days of the medical examination.

Silica hazard communication

The new rule requires contractors to include respirable crystalline silica in a hazard communication program and specifically address cancer, lung, immune system and kidney issues related to exposure.

Contractors must make sure workers:

- Demonstrate knowledge and understanding of hazards related to silica exposure
- Are aware of tasks in the workplace that can result in exposure
- Are aware of control measures the contractor has implemented to protect workers
- Are familiar with provisions of the new OSHA rule
- Know the identity of the competent person who will inspect job sites to implement the written exposure control plan
- Understand the purpose and features of the medical surveillance program

In NRCA's opinion, the use of water to control dust remains an area of substantial concern for operator safety

Objective data

The new rule allows the use of objective data to exempt a contractor from air-monitoring requirements and provide a basis for respirator selection according to OSHA. The agency notes reliance on objective data is intended to provide the same degree of assurance air monitoring does, so it comes with a similar, specific recordkeeping requirement.

The rule requires the objective data reflect workplace conditions closely resembling the processes, material types, control methods, work practices and environmental conditions as in a contractor's current operations. Industry data are acceptable under the rule's definition of the term. A contractor must maintain a record of the silica-containing material; source of the data; test protocol and results; a description; and other details regarding the process, task or activity on which the data are based. Because OSHA views objective data similar to employee exposure records, the rule requires the data be maintained for a period of at least 30 years.

Compliance date

The new rule is effective June 23, but compliance begins June 23, 2017.

NRCA action

NRCA plans to conduct air monitoring on select roofing job sites with the assistance of its members. The goal will be to catalog details of roofing tasks and processes that could form the basis for industry-wide objective data and possibly reduce the burden of the new regulation on our members. In addition, NRCA hopes to collect air monitoring results from previous projects that may be useful for compliance efforts. NRCA also plans additional educational programs to increase awareness and understanding of the new rule.

Since the inception of the silica proposed rulemaking, NRCA has been encouraging OSHA to tailor the requirements of the rule with an eye toward the more significant hazards roofing workers face while performing tasks that may involve silica exposure, specifically falls. The fall hazard issue remains NRCA's primary concern with the final rule. The association wants to maintain that focus to ensure roofing workers not only are protected from the health hazards related to silica but also more critically are kept secure from fall hazards that could be compounded by provisions of the new rule and most certainly can result in serious injury or death.

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