

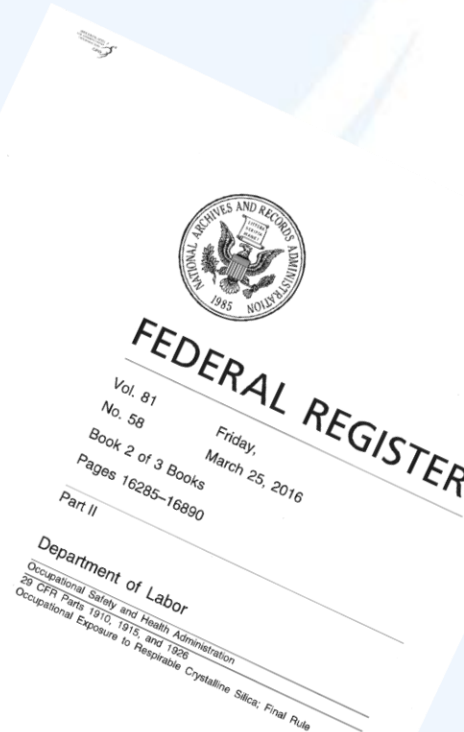
OSHA's Final Rule on Occupational Exposure to Respirable Crystalline Silica



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Reasons for the Rule

- Previous permissible exposure limits (PELs) are formulas that many find hard to understand
- Construction/shipyard PELs are obsolete particle count limits
- General industry formula PEL is about equal to $100 \mu\text{g}/\text{m}^3$; construction/shipyard formulas are about $250 \mu\text{g}/\text{m}^3$

Most Important Reason for the Rule

- **Previous PELs do not adequately protect workers**
- Exposure to respirable crystalline silica has been linked to:
 - Silicosis
 - Lung cancer
 - Chronic obstructive pulmonary disease(COPD)
 - Kidney disease
- Extensive medical evidence that lung cancer and silicosis occur at exposure levels below 100 $\mu\text{g}/\text{m}^3$

Most Important Reason for the Rule



YOU



Health Benefits

OSHA estimates that once the effects of the rule are fully realized, it will prevent:

- More than 600 deaths per year
 - Lung cancer: 124
 - Silicosis and other non-cancer lung diseases: 325
 - End-stage kidney disease: 193
- More than 900 new silicosis cases per year



Scope of Coverage

- Three forms of silica: quartz, cristobalite and tridymite
- Exposures from chipping, cutting, sawing, drilling, grinding, sanding, and crushing of concrete, brick, block, rock, and stone products (such as in construction operations)
- Exposures from using sand products (such as glass manufacturing, foundries, and sand blasting)



Workers and Industries Affected

- 2.3 million workers:
 - Construction: 2 million
 - GI/Maritime: 300,000
- 676,000 establishments
 - Construction: 600,000
 - GI/Maritime: 76,000

Respirable Crystalline Silica Rule

- Two standards:
 - One for general industry and maritime
 - One for construction
- Similar to other OSHA health standards and ASTM consensus standards

Permissible Exposure Limit (PEL)

- PEL = $50 \mu\text{g}/\text{m}^3$ as an 8-hour TWA
 - Worker must be protected
- Action Level = $25 \mu\text{g}/\text{m}^3$ as an 8-hour TWA
 - If below more monitoring not required
- 1 microgram = 1000 milligrams

Exposure Assessment

- Required if exposures are or may reasonably be expected to be at or above action level of $25 \mu\text{g}/\text{m}^3$
- Exposure assessments can be done by following:
 - The performance option
 - The scheduled monitoring option

Performance Option

- Exposures assessed using any combination of air monitoring data or **objective data** sufficient to accurately characterize employee exposure to respirable crystalline silica

Objective Data

- Includes air monitoring data from industry-wide surveys or calculations based on the composition of a substance
- Demonstrates employee exposure associated with a particular product or material or a specific process, task, or activity
- Must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations

Scheduled Monitoring Option

- Prescribes a schedule for performing initial and periodic personal monitoring
- If monitoring indicates:
 - Initial below the AL: no additional monitoring
 - Most recent at or above the AL: repeat within 6 months
 - Most recent above the PEL: repeat within 3 months
 - When two consecutive non-initial results, taken 7 or more days apart, are below the AL, monitoring can be discontinued
 - Reassess if circumstances change

Appendix A – Methods of Sample Analysis

- Employers must ensure that samples are analyzed by a laboratory that follows the procedures in Appendix A
- Appendix A specifies methods of sample analysis
 - Allows for use of OSHA, NIOSH, or MSHA methods
 - Analysis must be conducted by accredited laboratories that follow specified quality control procedures



Methods of Compliance – Hierarchy of Controls

- Employers can use any engineering or work practice controls to limit exposures to the PEL
- Respirators required when can't get below PEL with engineering and work practice controls

Engineering Controls (cont.)

Jackhammer use without engineering controls



Jackhammer use with water spray to control dust

Construction Standard

- (a) Scope
- (b) Definitions
- (c) Specified exposure control methods
- OR**
- (d) Alternative exposure control methods
 - (1) PEL
 - (2) Exposure Assessment
 - (3) Methods of Compliance
- (e) Respiratory protection
- (f) Housekeeping
- (g) Written exposure control plan
- (h) Medical surveillance
- (i) Communication of silica hazards
- (j) Recordkeeping
- (k) Dates



Construction – Scope

- All occupational exposures to respirable crystalline silica are covered, unless employee exposure will remain below $25 \mu\text{g}/\text{m}^3$ as an 8-hr TWA under any foreseeable conditions.

Construction – Specified Exposure Control Methods

- Table 1 in the construction standard matches 18 tasks with effective dust control methods and, in some cases, respirator requirements.
- Employers that fully and properly implement controls on Table 1 do not have to:
 - Comply with the PEL
 - Conduct exposure assessments for employees engaged in those tasks

Example of a Table 1 Entry

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Stationary masonry saws	<p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p>	None	None

Example of a Table 1 Entry

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.		
	<p>Operate and maintain tool in accordance with manufacturers' instruction to minimize dust</p> <ul style="list-style-type: none"> - When used outdoors - When used indoors or in an enclosed area 	<p>None</p> <p>APF 10</p>	<p>APF 10</p> <p>APF 10</p>

List of Table 1 Entries

- Stationary masonry saws
- Handheld power saws
- Handheld power saws for fiber cement board
- Walk-behind saws
- Drivable saws
- Rig-mounted core saws or drills
- Handheld and stand-mounted drills
- Dowel drilling rigs for concrete
- Vehicle-mounted drilling rigs for rock and concrete
- Jackhammers and handheld powered chipping tools
- Handheld grinders for mortar removal (tuckpointing)
- Handheld grinders for other than mortar removal
- Walk-behind milling machines and floor grinders
- Small drivable milling machines
- Large drivable milling machines
- Crushing machines
- Heavy equipment and utility vehicles to abrade or fracture silica materials
- Heavy equipment and utility vehicles for grading and excavating

Full Table 1

- www.osha.gov/silica/Table1sect1926.1153.pdf

Fully and Properly Implementing Controls Specified on Table 1

- Presence of controls is not sufficient.
- Employers are required to ensure that:
 - Controls are present and maintained
 - Employees understand the proper use of those controls and use them accordingly

Employees Engaged in Table 1 Tasks

- Employees are “engaged in the task” when operating the listed equipment, assisting with the task, or have some responsibility for the completion of the task
- Employees are not “engaged in the task” if they are only in the vicinity of a task

Respiratory Protection Requirements on Table 1

- Respirators required where exposures above the PEL are likely to persist despite full and proper implementation of the specified engineering and work practice controls
- Where respirators required, must be used by all employees engaged in the task for entire duration of the task
- Provisions specify how to determine when respirators are required for an employee engaged in more than one task



Housekeeping

- Dry Sweeping not allowed!
- Must do
 - Wet Sweeping,
 - HEPA-filtered vacuuming
 - Other dust minimizing methods
- Compressed air cleaning not allowed unless w/ventilation system

Construction – Written Exposure Control Plan

- The plan must describe:
 - Tasks involving exposure to respirable crystalline silica
 - Engineering controls, work practices, and respiratory protection for each task
 - Housekeeping measures used to limit exposure
 - Procedures used to restrict access, when necessary to limit exposures

Control Plan cont'd.

- Employer must review and evaluate effectiveness of Plan annually
- Employer must make Plan readily available to each employee when asked

Construction – Competent Person

- Construction employers must designate a competent person to implement the written exposure control plan
- *Competent person* is an individual capable of identifying existing and foreseeable respirable crystalline silica hazards, who has authorization to take prompt corrective measures
- Makes frequent and regular inspection of job sites, materials, and equipment

Construction – Medical Surveillance

- Employers must offer medical surveillance to workers **who will be required to wear a respirator under the standard** for 30 or more days a year.
- Employer must get “baseline” med exam <30 days after initial assignment unless done within 3 yrs. prior
- Employers must offer examinations every three years to workers who continue to be exposed.
- Exam includes medical and work history, physical exam, chest X-ray, and pulmonary function test (TB test on initial exam only)

Employee Training

- Employer must “ensure” that affected employees “can demonstrate knowledge and understanding of”:
 - Health hazards of silica dust inhalation
 - Tasks in workplace of silica dust exposure
 - Specific measures employer has implemented to prevent silica dust exposure
 - The pertaining OSHA rules
 - Who Competent Person is
 - Medical surveillance program



Recordkeeping

- Of all Exposure Measurements
- Of employee records regarding Medical Surveillance

Other Standards Must be Used

- Respiratory Protection
 - Clearance by physician to wear one
 - Annual fit-testing
 - Training on use and limitations
- HazCom
 - Products that contain silica must be labeled
 - Training that covers how silica can cause
 - Cancer, Lung disease, Immune deficiencies, kidney problems



Construction – Compliance Dates

- Employers must comply with all requirements (except methods of sample analysis) by Sept.23, '17
- Compliance with methods of sample analysis required by June 23, 2018

Guidance and Outreach

- Silica Rulemaking Webpage:
www.osha.gov/silica
 - Fact sheets
 - FAQs
 - Video
- Appendix B – Medical Surveillance Guidelines
- Small Entity Compliance Guides
 - <https://www.osha.gov/Publications/OSHA3902.pdf>.



Questions?





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