



ON-SITE

Safety & Health Consultation

Missouri Department of Labor & Industrial Relations

ASSE Silica Panel

Daniel Stark, CIH – Assistant Director

daniel.stark@labor.mo.gov

What is Silica and how do I get exposed?

- 3 forms of silica: quartz (most common), cristobalite and tridymite
- Exposures - chipping, cutting, sawing, drilling, grinding, sanding, and crushing of concrete, brick, block, rock, and stone products
- Exposures - sand products (such as glass manufacturing, foundries, and sand blasting)





What Silica does to you

Exposure to Respirable Crystalline Silica has been linked to:

- Silicosis;
- Lung cancer;
- Chronic obstructive pulmonary disease; and
- Kidney disease



Healthy Lung

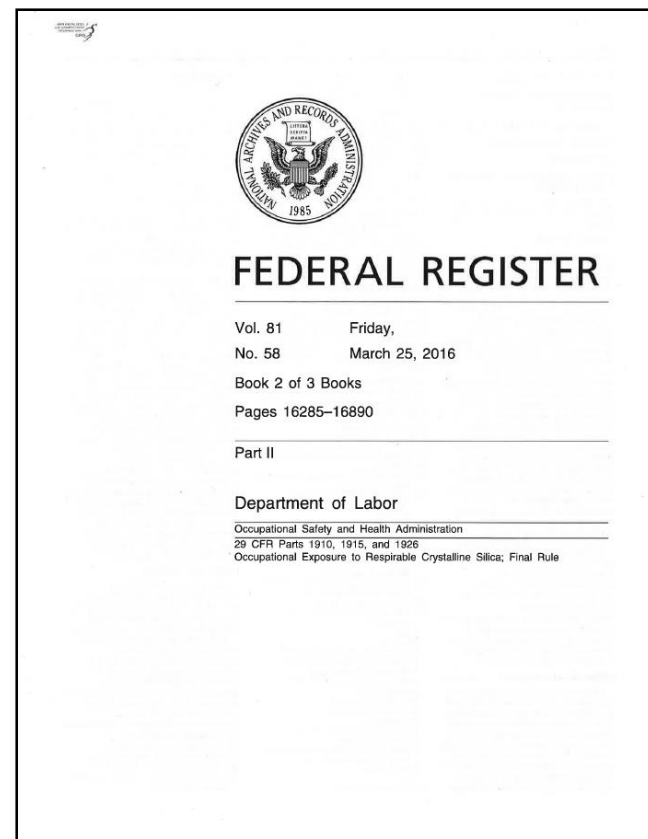


Your Lung on Silica
Any questions?



Respirable Silica Final Rule Published March 25, 2016

- Construction -
29 CFR 1926.1153
- General Industry –
29 CFR 1910.1053





Why did we need a new standard?

- Old Permissible Exposure Limit (PEL) not protective
- PELs for Silica are hard to understand - 10/%+2??
What??
- Construction/shipyard PELs are obsolete particle count limits

How much Silica can worker's be exposed to with the new Standard??

- PEL = 50 $\mu\text{g}/\text{m}^3$ as an 8-Hour TWA
- Action Level = 25 $\mu\text{g}/\text{m}^3$ as an 8-Hour TWA



You are at risk if the dust you breathe in over a full shift contains more RCS than the amount shown next to the penny



Silica Standard for **Construction** and General Industry

- (a) Scope
 - (b) Definitions
 - (c) Specified exposure control methods
- OR**
- (d) Alternative exposure control methods
 - PEL
 - Exposure Assessment
 - 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



Scope of Standard

- All occupational exposures to respirable crystalline silica are covered if the Action Level is reached in an 8 hr. TWA.
- If controls are needed to keep employee exposure below the Action Level; only the following items need to be done:
 - Written Exposure Control Plan
 - Competent Person (**Construction only**)
 - Housekeeping
 - Employee Training
 - Recordkeeping
- However, once the Action Level is reached, these items and more, much more is required!



STEP #1 - Write an 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
- Evaluate effectiveness annually, update as necessary



STEP #2 - Designate a “Competent Person” (**Construction Only**)

- 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



STEP #3 – Follow the correct cleanup procedures

- When it can contribute to exposure, employers must not allow:
 - Dry sweeping or brushing
 - Use of compressed air for cleaning surfaces or clothing, unless it is used with ventilation to capture the dust
- **However**, these methods can be used if no other methods like HEPA vacuums, wet sweeping, or use of ventilation with compressed air are feasible



STEP #4 - Communication of Hazards – Employee Training

- Employers required to comply with hazard communication standard (HCS) (29 CFR 1910.1200)
- Address: Cancer, lung effects, immune system effects, and kidney effects as part of HCS
- Train workers on health hazards, tasks with exposure, workplace protections, and medical surveillance
- Identify competent person (**Construction Only**)



STEP #5 – Records You Need to Keep

Must maintain records per 29 CFR 1910.1020 for:

- Air monitoring data
- Objective data
- Medical Surveillance



**My employee's exposure is over the
Action Limit.**

Now what do I do?



STEP #6 – Follow Table 1 (If you can) **Construction Only**

- 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 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)	<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 manufacturers' instruction to minimize dust</p> <ul style="list-style-type: none">- When used outdoors- When used indoors or in an enclosed area	None APF 10	APF 10 APF 10



Relationship between General Industry and Table 1 tasks

- General industry can use Table 1 tasks for compliance – (task must not be performed regularly in the same environment and conditions.)
- Construction standard can't be used to comply with General Industry (General Industry tasks are typically in the same environment and conditions.)

STEP #7 – Follow the Respiratory Protection Requirements in Table 1 (**Construction Only**)

- 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 are required:
 - they 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



I'm not doing any tasks in Table 1 – so now what do I do?

- Conduct an exposure assessment to determine whether workers are above the PEL;
- By using Alternative Exposure Control Methods:
 - Performance Option
 - or
 - 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



What's Objective Data?

- 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

What is it? - **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



STEP #8 – Notify Employees of Sampling Results

- Employer must notify individually each affected employee of the results of sampling in writing or posting within 5 working days of completion.
- If above the PEL, notification must include corrective action being taking to reduce the exposure to at or below the PEL.



STEP #9 – Make sure you are following the “Hierarchy of Controls”

- Employers shall use engineering or work practice controls to limit exposures to the PEL
- Respirators permitted where PEL cannot be achieved with engineering and work practice controls

Step #10 - Establish Regulated Areas (General Industry only)

- Establish if above or expected to be, above PEL
- Demarcate
- Post signs
- Limit access
- Provide and use respirators in regulated area.



Figure 2. Example of signage required for regulated areas.



STEP #11 – Comply with OSHA's Respiratory Protection Standard

- 29 CFR 1910.134
- Respirators required for exposures above the PEL:
 - While installing or implementing controls or work practices
 - For tasks where controls or work practices are not feasible
 - When feasible controls cannot reduce exposures to the PEL
 - While in a regulated area (General Industry/Maritime)



STEP #12 – Get your Employees checked by a Doctor

- Employers must offer medical examinations to workers IF:
 - they will be required to wear a respirator under the standard for 30 or more days a year (Construction)
 - At or above AL 30 or more days a year (General Industry)
 - Within 30 days of initial assignment.
- Must be offered examinations every 3 years to workers who continue to be exposed above the trigger.
- Exam includes: medical and work history, physical exam, chest X-ray, and pulmonary function test (TB test on initial exam only)



STEP #13 – Get the Doctor’s Report

- Worker receives report with detailed medical findings.
- Employer receives an opinion that only describes limitations on respirator use, and if the worker gives written consent, recommendations on:
 - Limitations on exposure to respirable crystalline silica, and/or
 - Examination by a specialist



Questions?