

ARMA Health, Safety, and Environment Committee

OSHA Respirable Crystalline Silica Standard Overview

Mark W. Klein, CIH

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OSHA Respirable Crystalline Silica (RCS) Standard

Background

- Summary of OSHA RCS Standard
- What is Respirable Crystalline Silica (RCS)

Review of RCS Standard

- Scope and Application
- Exposure Limits
- Exposure Assessment
- Ancillary Requirements

Comments / Discussion

Summary of RCS Standard

- OSHA silica standard released in March 2016
- 29 CFR 1910.1053 *Respirable Crystalline Silica*
- Effective Date: June 23, 2016
- Compliance Date: June 23, 2018
- Previous Regulation = PEL only
- New Regulation = PEL, AL, Ancillary Requirements
- Engineering controls required to the maximum extent feasible to lower potential exposures
- Ancillary requirements mostly at PEL, some at AL

What is RCS?

Respirable Crystalline Silica (RCS)

- Silica: chemical compound SiO_2
 - Silicon, silicates, and silicone are not silica
- Respirable: particle size at 4 microns and below
 - Reach the alveolar region of the lungs and may cause health effects
 - Larger non-respirable particles do not reach the alveolar region
- Crystalline: structural form that is capable of causing damage to alveolar region of the lungs
 - Amorphous silica does not have the structure to cause alveolar region damage

Scope and Application

Standard does not apply for:

- Construction activity, which is covered by a separate construction standard (29 CFR 1926.1153).
- Activity where employer has *objective data* that exposures are all below the action level under any foreseeable conditions, including the failure of engineering controls.



Scope and Application

Standard does not apply for:

- General industry activity where the employer complies with the construction standard, the task is listed on Table 1 of the construction standard, and the task is not regularly in the same environment and conditions.
 - Example: Facility uses power chipping tools occasionally when repairing concrete floors. Since power chipping tools are on Table 1, for this activity the facility could (1) comply with the overall provisions of the construction standard and (2) use combination of engineering controls, work practices, and respiratory protection specified on the table.

Scope and Application

- **Objective Data:**

- “information demonstrating employee exposure to RCS associated with a [...] specific process, task, or activity.”
- “The data must reflect workplace conditions closely resembling or with a higher exposure potential than the [...] employer's current operations.”
- OSHA’s examples include:
 - air monitoring data from industry-wide surveys
 - calculations based on the composition of a substance

Exposure Limits

- **PEL:** Revised 8-hour TWA permissible exposure limit of 50 ug/m^3
 - Reduction from the current PEL of $\sim 100 \text{ ug/m}^3$
 - No adjustment for extended workshift
 - Threshold for most ancillary requirements
- **AL:** New 8-hour TWA action level of 25 ug/m^3
 - Statistical likelihood of PEL compliance for majority of exposures
 - Threshold for two ancillary requirements

Exposure Assessment

Must assess the exposure of each worker who may be exposed at or above the action level through one of two methods:

1. Performance Option:
 - use objective data or existing air monitoring data
2. Scheduled Monitoring Option
 - Representative sampling for each shift/job/work area
 - Must sample for highest expected exposure
 - Initial then repeated sampling based on exposure

Exposure Assessment

Initial sampling outcome:

- < AL: no repeat sampling required
- \geq AL but < PEL: repeat within 6 months
- > PEL: repeat within 3 months

Repeat sampling outcome:

- \geq AL but < PEL: repeat again within 6 months
- > PEL: repeat again with 3 months
- < AL: repeat again more than 7 days but less than 6 months later
 - stop if repeat is also below AL
 - otherwise continue repeat sampling per above

Exposure Assessment

Reassessment:

- Must reassess the exposure of workers where changes may result in new or additional exposures at or above the AL
 - Equipment, process conditions, raw material, etc.

Methods of Sample Analysis:

- Must use a lab that meets the requirements of Appendix A



Exposure Assessment

Employee Notification:

- Results of exposure assessment must be communicated to affected employees with 15 days
- Affected employees are those whose exposures are represented by the sampling even if they were not personally sampled
- Communication by conspicuous posting of the results is acceptable
- Results must be communicated for either method (performance option or scheduled monitoring option)

Ancillary Requirements

Regulated Areas:

- Areas known or expected to cause exposure over the PEL
- Areas must be physically demarcated as a “regulated area”
- Access limited to authorized workers
- Area entrances marked with signs with specific legend (specified in later paragraph)
- Respirators are required for **any** entry
 - No time or frequency thresholds where respirators are not required



Ancillary Requirements

Engineering Controls:

- Engineering controls are process and equipment designs that limit emissions and exposure
- Controls could include process containment, general or local exhaust ventilation, and central vacuum systems

Work Practice Controls:

- Work practice controls are specific worker task methods used to limit exposure
- Examples: tools that allow equipment adjustment without entering a high exposure area; wetting down of silica-bearing minerals to limit dust emissions

Ancillary Requirements

Requirement for Control Implementation

- “Feasible” engineering and work practice controls must be installed / used where emissions could cause exposure over the PEL
- Controls required even if only an exposure reduction and not compliance to PEL (use respirators as secondary protection)
- No exposure time/day thresholds (e.g. 30 days of personal exposure before requiring controls)

Ancillary Requirements

Written Exposure Control Plan:

- Contents:
 - List and describe tasks that may cause RCS exposure
 - Describe engineering controls, work practices, and respiratory protection used to limit exposures for each task
 - Describe housekeeping measures used to limit exposures
- Review and update at least annually
- Plan contents correspond to employee training requirements

Ancillary Requirements

Respiratory Protection:

- Can be used only:
 - When exposures exceed the PEL while feasible controls are being installed/implemented
 - For tasks where exposures exceed the PEL and engineering/work practice controls are not feasible
 - For tasks where feasible controls have been implemented but exposures are still above the PEL
 - For entry to regulated areas
- Respirator program must be implemented in compliance with 29 CFR 1910.134 *Respiratory Protection*.



Ancillary Requirements

Housekeeping:

- Dry sweeping/brushing that “contributes to RCS exposure” not allowed:
 - unless alternatives like wet sweeping and HEPA vacuuming are not feasible
 - OSHA states in the preamble that “wet methods or HEPA vacuuming are not required where they would not be effective, would cause damage, or would create a hazard in the workplace.”

Ancillary Requirements

Housekeeping:

- Compressed air cleaning of surfaces or clothing not allowed unless:
 - Used in conjunction with ventilation that “effectively” captures the dust cloud created
 - Or no alternatives are feasible
- In all cases, the employer “bears the burden” of “demonstrating” that alternatives are not feasible.

Ancillary Requirements

Medical Surveillance:

- Two compliance dates:
 - Workers exposed over the PEL: June 23, 2018
 - Workers exposed at or over the AL: June 23, 2020
- Required for workers exposed more than 30 days per year over the PEL (2018) and at or over the AL (2020)
- Required initially and then every three years
- Similar to surveillance for respiratory protection with some additional requirements:
 - Work and medical history; physical exam; PFT; chest x-ray; TB test

Ancillary Requirements

Medical Surveillance:

- Must provide specific information on work duties, potential RCS exposure, and PPE to the health care professional
- Health care provider must provide written report to worker within 30 days
- Report to worker contains some information that is not provided to the employer unless worker provides written authorization
- Separate report provided to the employer
- When health care provider recommends follow-up by a specialist, the employer must make the specialist available within 30 days

Ancillary Requirements

Communication of RCS Hazards to Employees:

1. Hazcom

- Include RCS in Hazard Communication Standard compliance program
- Labels & SDS required
- Communicate specific health effects: Cancer, lung effects, immune system effects, and kidney effects

Ancillary Requirements

Communication of RCS Hazards to Employees:

2. Signs

- Required at entrance to all regulated areas

DANGER
RESPIRABLE CRYSTALLINE SILICA
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
WEAR RESPIRATORY PROTECTION IN THIS AREA
AUTHORIZED PERSONNEL ONLY

Ancillary Requirements

Communication of RCS Hazards to Employees:

3. Employee Information and Training:

- Make a copy of the regulation available to employees
- Must ensure employees have the following knowledge:
 - Health hazards associated with exposure to respirable crystalline silica
 - Specific tasks in the workplace that could result in exposure to respirable crystalline silica

Ancillary Requirements

Communication of RCS Hazards to Employees:

3. Employee Information and Training:

- Must ensure employees have the following knowledge:
 - Specific measures the employer has implemented to protect employees from exposure to respirable crystalline silica
 - The contents of the regulation
 - The purpose and a description of the medical surveillance program required by the standard

Ancillary Requirements

Recordkeeping:

Air Monitoring Data:

- Must maintain the following common information for each personal sample:

Sample Date	PPE Used
Task Monitored	Results of Sample
Sampling & Analytical Method	Analytical Lab Used
Duration of Sample	

- Additionally must maintain:
 - name, SSN, and job classification of all affected employees
 - indication of monitored employees



Ancillary Requirements

Recordkeeping:

Objective Data:

- Must maintain an accurate record of the data used for the exposure assessment:
 - The crystalline silica-containing material in question
 - The source of the objective data
 - The testing protocol and results of testing
 - A description of the process, task, or activity on which the objective data were based
 - Other data relevant to the process, task, activity, material, or exposures on which the objective data were based

Ancillary Requirements

Recordkeeping:

Medical Surveillance:

- Must maintain an accurate record for each employee in the medical surveillance program:
 - Name and social security number
 - A copy of the health care providers' and specialists' written medical opinions
 - A copy of the information provided to the health care provider and specialists

Retention:

- Maintain records for duration of employment plus 30 years in compliance with 29 CFR 1910.1020

Key Requirements of RCS Standard

- Determine the amount of silica that workers are exposed to and compare to the PEL and AL.
- Protect workers exposed above the PEL through engineering and work practice controls regardless of whether the result is PEL compliance.
- Designate “regulated areas” where workers could be exposed above the PEL: restrict access, mark with signage, and require respirators for entry.
- Restrict housekeeping practices such as dry sweeping and compressed air that expose workers to silica.

Key Requirements of RCS Standard

- Write and communicate a written exposure control plan that identifies exposure tasks and the methods used to protect workers.
- Provide medical surveillance for workers exposed at or above the action level for 30 or more days per year.
- Train workers on silica hazards, work operations that result in silica exposure, and ways to limit exposure.
- Review and update recordkeeping methods for exposure assessment, including significant requirements for each IH sample collected.

Comments / Discussion

Questions?



ARMA Summer Committee Meeting

Save the Date!

Next ARMA HSE Committee Meeting

September 13-14

Seattle, WA

Networking, Dinner, and Committee
Updates

