OSHA’s Final Rule on
Occupational Exposure to
Respirable Crystalline Silica:
The Construction Standard

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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 µg/m³; construction/shipyard formulas are about 250 µg/m³.
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
  - Kidney disease
- Extensive epidemiologic evidence that lung cancer and silicosis occur at exposure levels below 100 µg/m³
Health Benefits

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

• More than 600 deaths per year
  o Lung cancer: 124
  o Silicosis and other non-cancer lung diseases: 325
  o 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)
Industries and Operations with Exposures

- Construction
- Glass manufacturing
- Pottery products
- Structural clay products
- Concrete products
- Foundries
- Dental laboratories
- Paintings and coatings
- Jewelry production
- Refractory products
- Asphalt products
- Landscaping

- Ready-mix concrete
- Cut stone and stone products
- Abrasive blasting in:
  - Maritime work
  - Construction
  - General industry
- Refractory furnace installation and repair
- Railroads
- Hydraulic fracturing for gas and oil
Workers and Industries Affected

• 2.3 million workers:
  o Construction: 2 million
  o GI/Maritime: 300,000

• 676,000 establishments
  o Construction: 600,000
  o GI/Maritime: 76,000
Respirable Crystalline Silica Rule

• Two standards:
  o One for general industry and maritime
  o One for construction

• Similar to other OSHA health standards and ASTM consensus standards
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 μg/m³ 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:
  o Comply with the PEL
  o Conduct exposure assessments for employees engaged in those tasks
<table>
<thead>
<tr>
<th>Equipment / Task</th>
<th>Engineering and Work Practice Control Methods</th>
<th>Required Respiratory Protection and Minimum APF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drivable saws</td>
<td>For tasks performed outdoors only:</td>
<td></td>
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<tr>
<td></td>
<td>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</td>
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<tr>
<td></td>
<td>Operate and maintain tool in accordance with manufacturer’s instructions to minimize dust emissions.</td>
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<tr>
<td></td>
<td></td>
<td>None</td>
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Example of a Table 1 Control
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<td>Dowel drilling rigs for concrete</td>
<td>For tasks performed outdoors only: Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.</td>
<td>APF 10</td>
</tr>
</tbody>
</table>
Example of a Table 1 Control
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
Fully and Properly Implementing Controls Specified on Table 1

• Presence of controls is not sufficient.
• Employers are required to ensure that:
  o Controls are present and maintained
  o 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.
Alternative Exposure Control Methods – Permissible Exposure Limit (PEL)

• PEL = 50 µg/m³ as an 8-hour TWA
• Action Level = 25 µg/m³ as an 8-hour TWA
Alternative Exposure Control Methods – Exposure Assessment

- Required if exposures are or may reasonably be expected to be at or above action level of 25 µg/m³
- Exposures assessments can be done 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:
  o Initial below the AL: no additional monitoring
  o Most recent at or above the AL: repeat within 6 months
  o Most recent above the PEL: repeat within 3 months
  o When two consecutive non-initial results, taken 7 or more days apart, are below the AL, monitoring can be discontinued
  o 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
  o Allows for use of OSHA, NIOSH, or MSHA methods
  o Analysis must be conducted by accredited laboratories that follow specified quality control procedures
Alternative Exposure Control Methods – Methods of Compliance (Hierarchy of Controls)

• Employers can use any engineering or work practice controls to limit exposures to the PEL

• Respirators permitted where PEL cannot be achieved with engineering and work practice controls
Engineering Controls (cont.)

Grinding without engineering controls

Grinding using a vacuum dust collector
Engineering Controls (cont.)

Jackhammer use without engineering controls

Jackhammer use with water spray to control dust
Respiratory Protection

• Must comply with 29 CFR 1910.134
• Respirators required where specified by Table 1, or for exposures above the PEL:
  o While installing or implementing controls or work practices
  o For tasks where controls or work practices are not feasible
  o When feasible controls cannot reduce exposures to the PEL
Housekeeping

• When it can contribute to exposure, employers must not allow:
  o Dry sweeping or brushing
  o Use of compressed air for cleaning surfaces or clothing, unless it is used with ventilation to capture the dust
• Those methods can be used if no other methods like HEPA vacuums, wet sweeping, or use of ventilation with compressed air are feasible
Construction – Written Exposure Control Plan

• The plan must describe:
  o Tasks involving exposure to respirable crystalline silica
  o Engineering controls, work practices, and respiratory protection for each task
  o Housekeeping measures used to limit exposure
  o Procedures used to restrict access, when necessary to limit exposures
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 examinations to workers who will be required to wear a respirator under the standard for 30 or more days a year.
• Employers must offer examinations every three 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)
Medical Opinion

• Worker receives report with detailed medical findings, any work restrictions, and recommendations concerning any further evaluation or treatment.

• Employer receives an opinion that only describes limitations on respirator use, and if the worker gives written consent, recommendations on:
  o Limitations on exposure to respirable crystalline silica, and/or
  o Examination by a specialist
Communication of Hazards

• 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 resulting in exposure, workplace protections, the identity of the competent person, and the medical surveillance program
Recordkeeping

- Must maintain records per 29 CFR 1910.1020 for:
  - Air monitoring data
  - Objective data
  - Medical records
Construction – Compliance Dates

• Employers must comply with all requirements (except methods of sample analysis) by June 23, 2017

• 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 Guide
Questions?