Compliance with OSHA’s Silica Rule

- Rule’s obligations and implementation dates
- NAPA’s guidance documents and other assistance
- Milling and brooming equipment
Known health hazard and top priority for U.S. OSHA

Decades in the making; finalized in March 2016

Reduces occupational Permissible Exposure Limit (PEL) to 50 micrograms per cubic meter (µg/m³) across all sectors

General industry was “100” but construction was “250”

Proposed rule required respirators & “no visible dust” during milling

Industry: let’s work together to find a better solution

Participated in all aspects of rule-making process

Final rule provides some relief
Milling Machine Partnership

- Agency-Labor-Industry Partnership
- 10 years of increased effort to control milling machine dust
- During rule-making process, voluntary manufacturers’ commitment to include control technologies starting in 2017
  - Vacuum & enhanced spray systems on new machines
  - Retrofit spray systems on older machines
- Industry position: no milling respiratory protection needed
Final Rule compliance: big picture

- PEL for all industries set at 50 µg/m³ (prior construction @ 250)
- Construction compliance (e.g., milling) by June 2017
- Gen’l industry compliance (e.g., asphalt plant) by June 2018
- Numerous law suits and possibly Presidential action to halt rule
  - Can’t be “undone” using Congr. Review Act
- Milling: respiratory protection and visible emissions REMOVED
- Basic premise of rule: **specific engineering controls identified for many jobs/tasks/activities** called “Table 1”
- Other major obligations (will discuss individually)
  - Designate “Competent Person”
  - Develop a written Exposure Control Plan
  - Hazard Communication
  - Maintain appropriate records
(a) Scope
(b) Definitions
(c) Specified exposure control methods (Table 1)
   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
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 / 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**
Table 1 controls vs. assessment

- Table 1 controls generally involve equipment/activities with the following engineering controls:
  - water suppression
  - vacuum systems
  - enclosed cabs with HEPA filters

- If an employer chooses NOT to implement engineering controls:
  - must measure exposure
  - “Action Level” at ½ PEL
  - restrict access/dedicated clothes
  - medical monitoring / PPE / etc.
Milling operations and controls

- Fairly straight-forward although written a bit wonky
  - No allowable controls for milling > 4-inches of concrete
- All milling machines now have both “enhanced” water suppression AND vacuum controls; many since ~3 years ago
  - Both controls allow any depth cut of asphalt
  - Water-spray only allows milling up to 4-inches any pavement
- Reasonably priced retrofits available for many models
- “enhanced” water spray + surfactant (detergent)
- Small mills (skid-steer) require water suppression only
  - Enclosed cab as best practice
Brooming & sweeping controls

- Not as straight-forward

- Table 1: heavy equipment and utility vehicles that ..... 
  - abrade or fracture silica-containing material ...
  - do NOT abrade or fracture

- If abrasive: enclosed cab + water suppression (if grounds-crew present)

- If non-abrasive: water suppression *OR* enclosed cab when operator is only one engaged in activity

https://www.youtube.com/watch?v=SY49tv-WC5M
OSHA requires exposure assessment when using non-controlled equipment or when activity not Table 1 specified

- (short duration) brooming, flaggers, truck drivers

Employer must understand employee 8-hr TWA exposure

- low PEL still allows elevated exposure for short durations

Measuring airborne silica requires an IH and results lag

OSHA allows alternative methods of exposure assessment

Use of “real-time” dust monitor and silica content

Aggregate silica content varies but dust exposures can be large and PEL low

Rule of thumb: ~ 10% silica
Exposure example: uncontrolled brooming

- Theoretically relevant if brooming not considered Table 1
- Short duration, uncontrolled, or non-specified activities
- Should remain below Action Level of 25 µg/m³ (0.025 mg)

In general, *if a direct-read real-time monitor records respirable dust levels greater than 0.25 mg/m³ for an 8-hr TWA or 2.3 mg/m³ for a 45-min activity duration (with no further exposure) and the crystalline silica content in respirable dust is known to be approximately 10%*, then more in-depth IH monitoring would be appropriate.

- NAPA guidance for details
- Should be part of Exposure Control Plan and reviewed by Competent Person
- Some type of exposure assessment required ... but ..
Define a Competent Person

- Defined as someone who “can identify existing and foreseeable respirable crystalline silica hazards; is authorized to promptly eliminate or minimize silica hazards; [and] has the knowledge and ability to implement the written exposure control plan”

- Any “qualified” employee can be designated as competent

- Employer is responsible for determining what training is needed
  - NAPA to develop a short but comprehensive training webinar

- Duties include frequent and regular job site/equipment inspections; and implement the exposure control plan

- Doesn’t need to remain on jobsite but does need authority to take prompt corrective action which may include halting work

- Recommend a crew chief, foreperson, or other supervisor-type individual who regularly works on or inspects a job site
Must develop an exposure control plan that can be implemented by the Competent Person

- can be generic (not project-specific)

Plan must contain the following information:

- Description of tasks involving exposure to respirable silica
- Engineering controls, work practices, and respiratory protection for each task (e.g., water spray while brooming)
- Housekeeping measures used to limit exposure
- Procedures used to restrict access, when necessary to limit exposures (employee rotation/scheduling, signage)
Must comply with OSHA’s HazCom Standard

- Address health hazards associated with airborne silica
- Train workers on activities/tasks resulting in exposure, workplace protections, the identity of the competent person, and the medical surveillance program if applicable

Recordkeeping per existing Standard (29 CFR 1910.1200)

- Must maintain certain records for appropriate duration
- Air monitoring data, objective data, medical records, etc.
- Even MSDSs/SDSs since constitute exposure assessment
- Must retain for generally 30 years after employment
Work Safely with Silica

A one-stop source of information on how to prevent a silica hazard and protect workers.

(1) About

Regulations & Requirements

What's New

(2) Know the Hazard

Workers may be exposed to dangerous levels of silica dust when cutting, drilling, grinding, or otherwise disturbing materials that contain silica. These materials and tasks are common on construction jobs. Breathing that dust can lead to serious, often fatal illnesses. This section contains information that workers – and contractors – need to know to recognize the hazard, understand the risk factors, and work safely with silica.

Control the Dust

There are ways contractors can reduce the dust and reduce the hazard. This easy to use planning tool takes you step-by-step through conducting a job hazard analysis for silica, selecting appropriate controls, and creating a job-specific plan to eliminate or reduce silica hazards. You can save as a pdf, print and/or email your plan.

CREATE-A-PLAN

(2) Training & Other Resources

Find silica-related handouts, fact sheets, videos, toolbox talks and other resources for workers and contractors.

(2) What's Working

Contractors, workers, manufacturers, and researchers are on the lookout for the best ways to control silica dust. Learn what is happening in the field and share what you are doing.

(2) Ask a Question

Get answers to commonly asked questions about silica and ask one of your own.

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3. Training & Other Resources

What’s Working

Ask a Question
Know the Hazard

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Control the Dust

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CREATE-A-PLAN
Create-A-Plan to Control the Dust

Step 1. Will you generate dust containing silica on the job?

The materials listed below contain silica. Select all of the materials you plan to use. As you select a material a list of dust generating tasks will appear. Please select the task(s) that you will perform with the material.

- Asphalt
- Brick
- Cement
- Concrete
- Concrete Block
- Drywall
- Fiber Cement products
- Grout
- Gunite/Shotcrete
- Mortar
- Paints containing silica
- Plaster
- Refractory Mortar/Castables
- Refractory Units
- Rock
- Roof Tile (concrete)
- Sand
- Soll (fill dirt and top soil)
- Stone (including: granite, limestone, quartzite, sandstone, shale, slate, cultured, etc.)
- Stucco/EIFS
- Terrazzo
- Tile (clay and ceramic)
- Material Other

CONTINUE

If you will not be using one of the materials listed above or another silica-containing material, You Don't Need a Silica Control Plan.

If you are not sure if a material contains silica, there are several ways you can find out:

Option 1 - Check the label: OSHA's silica standard requires employers to include silica in their program to comply with the hazard communication standard. OSHA's Hazard Communication Standard requires materials containing silica to be labeled. Learn more

Option 2 - Check the Safety Data Sheet Learn more

Option 3 - Review the published data Learn more

Option 4 - Analyze a sample of the material Learn more

RETURN TO YOUR SILICA CONTROL PLAN

(1) Register

(2) How it works

(3)
Step 1. Will you generate dust containing silica on the job?

The materials listed below contain silica. Select all of the materials you plan to use. As you select a material a list of dust generating tasks will appear. Please select the task(s) that you will perform with the material.

- Asphalt
- Refractory Mortar/Castables
- Refractory Units
- Abrasive blasting
- Bushhammering
- Cutting/sawing
- Demolishing/disturbing
- Drilling/coring
- Earthmoving
- Grinding
- Jackhammering
- Milling
- Mixing/pouring
- Other
- Polishing
- Sacking/patching
- Sanding
- Scabbling
- Scarifying
- Scraping
- Sweeping/cleaning up
- Test Task
- Abrasive blasting
- Bushhammering
- Cutting/sawing
- Demolishing/disturbing
- Drilling/coring
- Earthmoving
- Grinding
- Jackhammering
- Milling
- Mixing/pouring
- Other
- Polishing
- Sacking/patching
- Sanding
- Scabbling
- Scarifying
- Scraping
- Sweeping/cleaning up
- Test Task
- Roof Tile (concrete)
- Sand
- Soil (fill dirt and top soil)
- Stone (including: granite, limestone, quartzite, sandstone, shale, slate, cultured, etc.)
- Stucco/EIFS
- Terrazzo
- Tile (clay and ceramic)
- Material Other

CONTINUE
Step 2 -- *(g)(1)(ii)*

More information to help you decide how to control the dust:

**Option 1 – OSHA Exposure Control Methods:** The exposure control methods and respiratory requirements specified in the OSHA silica standard. [Learn More](#)

**Option 2 – Perform Air Monitoring:** Information on how to find an industrial hygienist to conduct air monitoring, questions to ask, and what’s involved. [Learn More](#)

**Option 3 – Studies and Data on the Use of Dust Controls:** Summaries of research findings, reports, and data. [Learn More](#)

**Option 4 – OSHA’s On-site Consultation Program:** [Learn More](#)

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### Examples of Equipment and Control Options* for the material and task you selected.

1. **Hand-Held Masonry Saw with Vacuum**
   - Bosch 1364 – 12-inch Abrasive Cut-off Saw w/ Bosch Airsweep™ 13 Gallon Wet/Dry Vacuum with Power Broker™
     - Manufacturer: Bosch - Saw
     - Manufacturer: Bosch - Vacuum
     - Learn More: OSHA - Fact Sheet
     - Learn More: Construction Solutions
   - [See how it works](#)
   - [Manufacturer](#)
   - [Learn More: OSHA - Fact Sheet](#)
   - [Learn More: Construction Solutions](#)

2. **Hilti DCH 300 Hand-held Electric Diamond Cutter w/ VC 40-U HEPA Vacuum**
   - See how it works
   - Manufacturer: Hilti - Saw
   - Manufacturer: Hilti - Vacuum
   - Learn More: OSHA - Fact Sheet
   - Learn More: Construction Solutions

3. **Husqvarna K 3000 14-inch Vac Electric Power Cutter**
   - [See how it works](#)
   - [Manufacturer](#)
   - [Learn More: OSHA - Fact Sheet](#)

*OPWR does not endorse any specific equipment or product. Many factors influence the effectiveness of a control including maintenance, user skill and training, the appropriateness of the equipment/control for the task, and manufacturer instructions/requirements. Respiratory protection may be needed when controls do not bring the silica exposures down to or below OSHA’s Permissible Exposure Limit (PEL).
Step 3. Complete your Silica Control Plan

Company
Person completing the plan
Jobsite/Project
Description of work

Restricting Access (g)(1)(iv)

Competent Person (g)(4)

Housekeeping (g)(1)(iii)

Medical Surveillance

Other Considerations
Final Plan

Print/Email/Download/Save Your Plan

(g)(2) & (3)

Your Silica Control Plan

Company:
XYZ Construction

Jobsite/Project:
Local School

Person Completing the Plan/Title:
John Doe

Description of Work:
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Task/Control Description:

1) Hand-Held Masonry Saw with Vacuum
2) Hand-Held Masonry Saw with Water

Material - Task
Brick - Cutting/sawing

Equipment and Control(s):

Safety of Others:
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Worker Training:
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Housekeeping:
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Medical Surveillance:
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Other Considerations:
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Material - Task
Rock - Drilling/coring

Equipment and Control(s):

Heavy Equipment with Cab Filtration System

Task/Control Description:

2) Rock - Drilling/coring

Material - Task
Rock - Jackhammering

Equipment and Control(s):

Jackhammer with Vacuum

Task/Control Description:

3) Rock - Jackhammering

Material - Task
Rock - Jackhammering

Equipment and Control(s):

Jackhammer with Vacuum

Task/Control Description:

If you have trouble downloading a PDF, click on Print and then select “Open PDF in Preview.” This will allow you to print or save a PDF version of your plan.
The train has left the station; difficult to stop

- Compliance for construction activities June 2017 (pending litigation or legislative efforts)
- Will require employer identification of job-task exposure
- Milling Partnership successful: eliminated need for respirators
  - Mills **will require** controls (new or retrofit @ ~ $12-15k)
  - Small mills (skid-steer) only require water suppression
- Brooms may need enclosed cab / water suppression
  - Dependent on how employer classifies
  - Recommend conducting **internal** limited exposure assessment with real-time dust monitor for ancillary activities like uncontrolled brooming and flagging
- Bottom line: compliance activities are responsibility of employer; rely on common sense; be careful of consultants
Summary

- Bottom line: compliance activities are responsibility of employer; rely on common sense; be careful of consultants
- Equipment controls are straightforward: mills and brooms
- Identify your company’s “competent person(s)” ... should be crew supervisory level
- Develop an Exposure Control Plan for your activities
  - Utilize exposure assessment information to assist
- Make sure your HazCom plan is updated
- Make sure you keep the appropriate records and inform employees of any industrial hygiene testing results as well as exposure assessments
- NAPA is available to help