

- 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 ($\mu\text{g}/\text{m}^3$) 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



The screenshot shows the OSHA website header with the United States Department of Labor logo and the text "UNITED STATES DEPARTMENT OF LABOR". Below the header is the OSHA logo and the text "Occupational Safety & Health Administration". A navigation menu includes "Home", "Workers", "Regulations", "Enforcement", and "Data & Statistics". A "Highlights" section features a news article titled "Silica: The Deadly Dust" with a sub-headline "Learn more about OSHA's Rulemaking". The article image shows a person's chest and lungs, with a close-up of a person's face wearing a respirator.

- 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



- PEL for all industries set at 50 $\mu\text{g}/\text{m}^3$ (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

- 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 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 $\frac{1}{2}$ PEL
 - restrict access/dedicated clothes
 - medical monitoring / PPE / etc.



- 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



- **Not as straight-forward**
 - **Definitional / dependent on whether Table 1 applicable**
- **Table 1: heavy equipment and utility vehicles that**
 - **abrade or fracture silica-containing material**
 - **do NOT abrade or fracture**
- **Enough information in the Rule that would allow a “non-abrasive classification”**
- **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**



- **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
- Must remain below the Action Level of $25 \mu\text{g}/\text{m}^3$

In general, if a direct-read real-time monitor records respirable dust levels greater than $0.25 \text{ mg}/\text{m}^3$ for an 8-hr TWA or $2.3 \text{ mg}/\text{m}^3$ 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 ..



Designate 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)



(1) About

Regulations &
Requirements

What's New

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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.

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.

Ask a Question

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

(2) Know the
Hazard

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A ONE-STOP SOURCE OF INFORMATION ON HOW TO PREVENT A SILICA HAZARD AND PROTECT WORKERS



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3. Training & Other Resources

What's Working

Ask a Question

(3)



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Create-A-Plan to Control the Dust

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REGISTER

Returning users login below.

Email

Password

LOGIN

[Forgot your password?](#)

CLEAR THE PLAN

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.

How does the Create-A-Plan tool work?

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

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... [learn more.](#)

(3)

(1) Register

(2) How it works

To find out if a material contains silica:

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](#)

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

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**Step 1 --
(g)(1)(i)**

Asphalt

Brick

- | | |
|--|---|
| <input type="checkbox"/> Abrasive blasting | <input type="checkbox"/> Polishing |
| <input type="checkbox"/> Bushhammering | <input type="checkbox"/> Sacking/patching |
| <input checked="" type="checkbox"/> Cutting/sawing | <input type="checkbox"/> Sanding |
| <input type="checkbox"/> Demolishing/disturbing | <input type="checkbox"/> Scabbling |
| <input type="checkbox"/> Drilling/coring | <input type="checkbox"/> Scarifying |
| <input type="checkbox"/> Earthmoving | <input type="checkbox"/> Scraping |
| <input type="checkbox"/> Grinding | <input type="checkbox"/> Sweeping/cleaning up |
| <input type="checkbox"/> Jackhammering | <input type="checkbox"/> Test Task |
| <input type="checkbox"/> Milling | |
| <input type="checkbox"/> Mixing/pouring | |
| <input type="checkbox"/> Other | |

Cement

Concrete

Concrete Block

Drywall

Fiber Cement products

Grout

Guniting/Shotcrete

Mortar

Paints containing silica

Plaster

Refractory Mortar/Castables

Refractory Units

Rock

- | | |
|---|---|
| <input type="checkbox"/> Abrasive blasting | <input type="checkbox"/> Polishing |
| <input type="checkbox"/> Bushhammering | <input type="checkbox"/> Sacking/patching |
| <input type="checkbox"/> Cutting/sawing | <input type="checkbox"/> Sanding |
| <input type="checkbox"/> Demolishing/disturbing | <input type="checkbox"/> Scabbling |
| <input checked="" type="checkbox"/> Drilling/coring | <input type="checkbox"/> Scarifying |
| <input type="checkbox"/> Earthmoving | <input type="checkbox"/> Scraping |
| <input type="checkbox"/> Grinding | <input type="checkbox"/> Sweeping/cleaning up |
| <input checked="" type="checkbox"/> Jackhammering | <input type="checkbox"/> Test Task |
| <input type="checkbox"/> Milling | |
| <input type="checkbox"/> Mixing/pouring | |
| <input type="checkbox"/> Other | |

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. How do you plan to control the dust?

Select the type of equipment and dust control you plan to use for each material and task you selected in Step 1.

Not Sure - Perform Air Monitoring.

To find the exposure control methods in OSHA's silica standard, learn about air monitoring, or to find studies and data on the use of controls [click here](#). To give users the greatest flexibility, any material-task combination may be selected. For uncommon combinations or those not typically performed, the default control is respiratory protection. → (1)

1 Brick - Cutting/sawing

COMPLETED

Select the Equipment/Control:

[Click here](#) for examples of commercially available equipment and controls.

- Hand-Held Masonry Saw with Vacuum (2)
- Hand-Held Masonry Saw with Water
- Splitter
- Stationary Masonry Saw with Vacuum
- Stationary Masonry Saw with Water
- Other

Describe the specific task and equipment/control you plan to use for this job. (3)

2 Rock - Drilling/coring

COMPLETED

Select the Equipment/Control:

[Click here](#) for examples of commercially available equipment and controls.

- Heavy Equipment with Cab Filtration System
- Other

Describe the specific use for this job.

3 Rock - Jackhammering

Select the Equipment/Control:

[Click here](#) for examples of commercially available equipment and controls.

- Jackhammer with Vacuum
- Jackhammer with Water
- Other

Describe the specific use for this job.

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](#)

[RETURN TO YOUR SILICA CONTROL PLAN](#)

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

Hand-Held Masonry Saw with Vacuum

1. *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](#)

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: [Husqvarna](#)
-  Learn More: [OSHA - Fact Sheet](#)

[RETURN TO YOUR SILICA CONTROL PLAN](#)

*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

Step 3

Company:

Person Completing the Plan/Title:

Jobsite/Project:

Description of Work:

Company

Person completing the plan

Jobsite/Project

Description of work

Please fill in the name and title of the person assigned as the competent person for silica Required by 29 CFR 1926.1153 (g)(4).

[Click here](#) for an explanation of what a competent person is, why it is important to assign one for silica, and what this on the job.

Competent Person (g)(4)

Exposure Assessment and Controls

- 1** **Materials:** Brick **Task:** Cutting/sawing

Equipment and Control(s): 1) Hand-Held Masonry Saw with Vacuum, 2) Hand-Held Masonry Saw with Wa

Task/Control Description: Lorem ipsum dolor sit amet, postea explicari no eum, cu veniam persecuti eam. Eos debet reprimique ut. Legimus accumsan voluptatum no eam, mollis minimum nominati in cum, pro pro
- 2** **Materials:** Rock **Task:** Drilling/coring

Equipment and Control(s): Heavy Equipment with Cab Filtration System

Task/Control Description: Lorem ipsum dolor sit amet, postea explicari no eum, cu veniam persecuti eam. Eos debet reprimique ut. Legimus accumsan voluptatum no eam, mollis minimum nominati in cum, pro pro
- 3** **Materials:** Rock **Task:** Jackhammering

Equipment and Control(s): Jackhammer with Vacuum

Task/Control Description: Lorem ipsum dolor sit amet, postea explicari no eum, cu veniam persecuti eam. Eos debet reprimique ut. Legimus accumsan voluptatum no eam, mollis minimum nominati in cum, pro pro

Please describe the procedures to restrict access to work areas, when necessary, to min employees exposed to respirable crystalline silica and their level of exposure, including by other employers or sole proprietors. Required by 29 CFR 1926.1153 (g)(1)(iv)

Restricting Access (g)(1)(iv)

Please use the space below to describe the training that will be provided to workers engaged in dust producing tasks and those working nearby.

[Click here](#) for an explanation of the elements of a worker-training program. Materials to help you conduct your training program are available on this site - just click "Training and Other Resources."

Click here forTraining

Please use the space below to describe the housekeeping measures that will be used on the project to limit employee exposure to respirable crystalline silica. Required by 29 CFR 1926.1153 (g)(1) (iii)

[Click here](#) to learn more about recommended housekeeping activities.

Housekeeping (g)(1)(iii)

Please use the space below to describe medical surveillance that will be provided to workers exposed to silica dust.

[Click here](#) to learn more about medical surveillance. Additional materials on the risk, information workers should provide their physicians, and steps to work safely with silica are available on this site - just click "Know the Hazard."

Medical Surveillance

Please use the space below to describe other things that need to be taken into consideration when controlling dust on this project.

[Click here](#) to learn more about possible things to consider.

Other Considerations

CONTINUE

You do not need to register to use the planning tool, however, registering will allow you to **confidentially** save, retrieve, edit, rename or delete saved plans. Only you have access to your saved plans.

Returning users login below.

Email Password

REGISTER

LOGIN

Forgot your password?

Step One > Step Two > Step Three

CLEAR THE PLAN

Your Silica Control Plan

Company: XYZ Construction	Person Completing the Plan/Title: John Doe
Jobsite/Project: Local School	Description of Work: Lorem ipsum dolor sit amet, postea explicari no eum, cu veniam persecuti eam. Saepe adolescens in pri. Eos debet reprimique ut. Legimus accusan voluptatum no eam, mollis minimum nominati in cum, pro prompta sadipscing ei.
Competent Person Jane Doe	

1 **Material** **Task**
 Brick Cutting/sawing

Equipment and Control(s)
 1) Hand-Held Masonry Saw with Vacuum, 2) Hand-Held Masonry Saw with Water

Task/Control Description
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2 **Material** **Task**
 Rock Drilling/coring

Equipment and Control(s)
 Heavy Equipment with Cab Filtration System

Task/Control Description
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3 **Material** **Task**
 Rock Jackhammering

Equipment and Control(s)
 Jackhammer with Vacuum

Task/Control Description
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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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- PRINT
- EMAIL
- DOWNLOAD AS PDF
- SAVE YOUR PLAN
- CLEAR THE PLAN

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.

Final Plan

Print/ Email/Download/ Save Your Plan (g)(2) & (3)

- 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

- **Bottom line: compliance activities are responsibility of employer; rely on common sense; be careful of consultants**
- **Equipment controls are straight forward: 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**