

AMERICAN SOCIETY OF SAFETY PROFESSIONALS

Silica: What We Now Know About Its Implementation

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Agenda Overview

- Brief Review of the Standards Requirements
- Detailed Review of the Elements of Table 1
- Proposed Changes to Table 1
- Case Studies for Ensuring Compliance
- Why Some Comply/Why Some Don't Comply
- OSHA "Frequently Asked Questions"
- •OSHA's National Emphasis Program/Inspectional Procedures



Silica in Construction- 29 CFR1926.1153





The "Newly" Revised Standards-No Longer New

Issued Date June 23, 2016

General Obligation Dates Construction-June 23, 2017 General Industry-June 23, 2018





Scope of New Standard

All occupational exposures to respirable crystalline silica are covered in the standard unless employee exposure "will remain below 25 μ g/m³ as an 8-hr TWA under any foreseeable conditions"



Permissible Exposure Limit (PEL) Reduced and Action Level Added

•PEL Reduced from 250 μ g/m³ and 100 μ g/m³ to 50 μ g/m³ for an 8-Hour TWA

Action Level added at
<u>25 µg/m³</u> for an 8-Hour TWA





Brief Review of the "New" Standard Requirements

Limit Worker Exposures to Crystalline Silica

- 1. Follow the Requirements of Table 1 of the standard or
- 2. Measure workers' exposure to Silica and independently decide which dust controls work best to limit exposures to the Permissible Exposure Levels.



Air Sampling/Using Objective Data-Exposure Control Procedures

It is important to note that when tasks are not listed on Table 1: Example-Small Electric Mixers

Need Air Sampling Results to show that workers are Not Above PEL

OSHA allows employers to use objective data to provide evidence that the control method(s) in place reduces the exposure level below 50 µg/m3 over an 8-hour TWA work period. Objective data can be air monitoring data compiled by the employer or a third party, such as universities, trade associations, or manufacturers, which is sufficient to accurately characterize exposure. The data relied on us must reflect conditions that are similar or worse than the employers current worksite conditions.



Brief Review of the "New" Standard Requirements

Regardless of which exposure control method is used, the construction standard requires the following;

- 1. Written Exposure Control Plan that identifies tasks that involve exposure and methods used to protect workers
- 2. Designate a Competent Person to implement the written Exposure Control Plan
- 3. Restrict housekeeping practices that expose workers to silica
- 4. Offer medical exams to workers who are required by the standard to wear a respirator for 30 or more days per year



Written Exposure Control Plan

Should include:

- A description of the tasks that involve exposure to respirable crystalline silica;
- A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure
- A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica;
- A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica



Designate a Competent Person

That's an individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them.

The Competent Person must have the knowledge and ability necessary to fulfill the responsibilities set forth [in 29 CFR 1926.1153(g)].



Housekeeping

Do not allow dry sweeping or brushing Do not allow compressed to clean clothing or surfaces





Medical Surveillance

Contractors must offer medical exams to <u>workers who will be</u> required to wear a respirator under the silica standard for 30 or more days a year. If a worker wears a respirator performing a silica-generating task for only part of a day (=/>15 Minutes) that time is counted as one day. <u>Time spent using a respirator for</u> work not covered by the standard, for example, as protection from welding fumes, does not count toward the 30 day requirement.



Protecting Workers

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	Must the Employer Follow this Requirement?		
Requirement	If Fully and Properly Implementing Table 1	If Following Alternative Exposure Controls	
PEL	No	Yes	
Exposure Assessment	No	Yes, when exposures are reasonably expected to be above the action level.	
Methods of Compliance	No	Yes	
Respiratory Protection	Yes, if respirator use is required by Table 1	Yes, if respirator use is required to reduce exposures to the PEL	
Housekeeping	Yes	Yes	
Written Exposure Control Plan	Yes	Yes	
Medical surveillance	Yes, for employees who must wear a respirator under the silica standard for 30 or more days a year.		
Communication of Hazards	Yes	Yes	
Recordkeeping	Yes, for any employees who are getting medical examinations	Yes, for exposure assessments and for any employees who are getting medical examinations	

Table 1-Specified Exposure ControlMethods When Working with MaterialsContaining Crystalline Silica

- 1. Stationary masonry saws
- 2. Handheld power saws
- 3. Handheld power saws for cutting fiber cement board
- 4. Walk-behind/driveable saws
- 5. Rig-mounted core saws or drills
- 6. Handheld and stand-mounted drills
- 7. Dowel drilling rigs for concrete
- 8. Vehicle-mounted drilling rigs for rock and concrete



Table 1-Specified Exposure ControlMethods When Working with MaterialsContaining Crystalline Silica (continued)

- 9. Jackhammers and handheld powered chipping tools 10. Handheld grinders for mortar removal (tuckpointing)
- 11.Handheld grinders for other than mortar removal
- 12. Walk-behind milling machines and floor grinders
- 13. Small/Large drivable milling machines
- 14. Crushing machines
- 15. Heavy equipment and utility vehicles to abrade or fracture silica materials
- 16. Heavy equipment and utility vehicles for grading and excavating



Table 1

Each Element of Table 1 has specified;
Engineering and Work Practice Controls Methods
Potential Respiratory Protection Requirements

Note: These are extremely important but beyond the scope of this presentation.





Stationary Masonry Saws

A construction worker using a stationary masonry saw with an integrated water delivery system.



Handheld Power Saws

A construction worker using a handheld power saw with an integrated water delivery system.



Handheld **Power Saws Used to Cut Fiber-Cement Board**

Worker cutting fiber-cement board outdoors using a handheld power saw with a vacuum dust collection system.



Walk-Behind Saws

Worker using a walkbehind saw with an integrated water delivery system to cut asphalt roadway.



Handheld and Stand-Mounted Drills

Worker drilling into concrete with a rotary hammer equipped with a shroud and dust collection system.



Drivable Saws

A construction worker cutting pavement using a drivable saw with an integrated water delivery system.



Jackhammers or Handheld Powered Chipping **Tools**

A worker chips concrete with a jackhammer using a water-spray attachment to control dust.



Handheld **Grinders for Tasks Other Than Mortar** Removal

Example of a handheld grinder with integrated water delivery system.



Dowel Drilling Rigs for Concrete

Worker drilling horizontal holes in concrete slab with a dowel drilling rig. The shroud surrounds the drill steel where it enters the concrete.



Walk-Behind Milling **Machines** and Floor Grinders

Worker milling granite floor indoors with milling machine and vacuum dust collection system.



Crushing Machines

Crushing machine being loaded with construction debris by an excavator.



Heavy **Equipment and Utility Vehicles Used During Demolition** Activities

Excavator equipped with an enclosed cab and hoe-ram demolishing a concrete wall.



Heavy **Equipment and Utility Vehicles Used** for **Grading and** Excavating Tasks

Backhoe with enclosed cab



Vehicle-Mounted Drilling Rigs for Rock and Concrete

Vehicle-mounted drilling rigs with dust collection system around drill bit and low-flow water spray to wet the dust discharged from the dust collector. The enclosed operator's cab is on the right.

Potential Changes to Table 1

- OSHA is interested in information on the effectiveness of control measures not currently included for tasks and tools listed in Table 1.
- The Agency is also interested in tasks and tools involving exposure to respirable crystalline silica that are not currently listed in Table 1, along with information on the effectiveness of dust control methods in limiting worker exposure to respirable crystalline silica when performing those operations.
- OSHA intends to evaluate the available information to determine if revisions to Table 1 may be appropriate.
- This potential change was published August 15, 2019.

Potential Changes to Table 1





Case Study 1--Following Table 1



Table 1-Specified Exposure Control MethodsWhen Working with Materials ContainingCrystalline Silica

Table 1. Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica

Equipment/Task	Engineering and Work Practice Control Methods	Required Air-Purifying Respirator (Minimum Assigned Protection Factor)	
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	Using drill equipped with commercially available shroud or cowling with dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Use a HEPA-filtered vacuum when cleaning holes.	<u><</u> 4 hr/day	>4 hr/day



Silica Task Evaluation Request Form

Silica Task Evaluation Request Form



Project No. *

Division of Work * What division of work should this be assigned to?

Select

Contractor * What contractor should this work have been assigned to?

Description of Material * To be drilled, ground, cut, mixed, etc.

Actvity *

Describe work activity

Select

Location *

Is the work in an enclosed area, indoors or outdoors?

Select

File Attachments *

Attached bulk sample results, safety data sheets, photographs of work area(s), etc.

Drag and drop files here or browse files

Comment *

What tools will be used to complete work (if drill - bit size, depth and number of holes)? How will work be completed, including means and method, name of DSPG staff performing work (to check respirator qualification status), etc.

Task Evaluation :: Mixing Bagged Material

Enclosed - Interior Work Area



Mixing bagged material for floor leveling, door frame infill.

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The task will involve opening bags of silica containing material, transferring the material from the bag into a bucket, mixing the material and then disposal of the bags.

Fugitive dust will be controlled using a local exhaust ventilation (LEV) system. The LEV will be attached to a bucket rim nozzle while mixing. The LEV will be attached to the lid of a 30 gallon waste barrel during bag disposal.

Transferring material and mixing the material within the barrel. Attach vacuum to bucket nozzle (The ARDEX DUSTFREE Hose Adapter may be loose when installing onto the DUSTFREE unit itself. It is recommended that a small amount of black electrical tape be wrapped around the end of the attachment to create a tighter, more secure connection.)

Place nozzle onto bucket, then start vacuum. Transfer and mix material.

Then place vacuum hose into 2" hole provided in trash barrel lid. The empty bag is placed open end first into the 12" hole created in lined trash barrel using a broom handle.

patching, etc. PPE for task includes: Project required, knee pads (as may be required)

Sample Results





Case Study 2 – "Outside" Table 1 Mixing Bagged Material-Indoors

The task will involved opening bags of silica containing material, transferring the material from the bag into a bucket, mixing the material and then disposal of the bags.



Sample Results

Date	Sample Duration (minutes)	Percent Silica (%)	Concentration Silica (ug/m ³)	Respirator APF
10/10/18	426	8.2	38	Not Required

Case Study 3 – "Outside" Table 1 Mixing Concrete-Outdoors

The task involved remotely opening bags of silica containing material into a silo with a shroud built into the top and bottom

Sample Results

Date	Sample Duration (minutes)	Percent Silica (%)	Concentration Silica (ug/m ³)	Respirator APF
5/10/18	420	0	<0.011	Not Required



Silica Air Sampling (Various Activities)

Activity	Sample Duration (minutes)	Percent Silica (%)	Concentration Silica (ug/m ³)	Respirator APF
Installing Fire Suppression Pipe with cordless drill	389	0.15	22	Not Required
Using Industrial Floor Sweeper for concrete sealant preparation	366	0.10	16	Wearing ½ face respirator with P100 cartridges



General disregard or lack of knowledge of the standard





Don't understand how to comply



They don't want to spend the money on Table 1 compliant equipment





- •Air Pump \$600
- Sampling Medium \$100/each
- Sample Analysis \$80/sample





Washer/Mister - \$500



Hammer Drill and Vacuum Attachment --\$3,500





CC3700 Electric Core Concrete Saw – \$13,295





There equipment gets damaged or lost in the field





Frequently Asked Questions

OSHA webpage often offers a "frequently asked questions" for many of their new standards. The following are some the 53 listed for the Construction Standard (29 CFR 1926.1153)



Has OSHA identified specific tasks that are likely to be outside the scope of the standard because they typically generate exposures below the AL of 25 μ g/m3 as an 8-hour TWA under all foreseeable conditions?

Yes When the following tasks are performed in isolation from other silica-generating tasks, they typically do not generate silica at or above the AL of 25 μ g/m3 as an 8-hour TWA under any foreseeable conditions:

- mixing <u>small</u> amounts of mortar;
- mixing <u>small</u> amounts of concrete;
- mixing bagged, silica-free drywall compound;
- mixing bagged exterior insulation finishing system (EIFS) base and finish coat;
- removing concrete formwork;
- using block or tile splitters;
- using manual (i.e., non-powered) chisels, shears, and utility knives



Does the standard cover employees who perform silica-generating tasks for only 15 minutes or less a day?

- 1. The standard <u>does not include a specific exemption for tasks</u> with only short-term exposures (e.g., tasks with exposures for 15 minutes a day or less).
- 2. However, OSHA has identified carpenters, plumbers, and electricians as types of workers who may perform tasks (e.g., drilling with a handheld drill) involving occasional, brief exposures to silica that are incidental to their primary work. Provided that these employees perform these tasks in isolation from activities that generate significant exposures to silica, and perform them for no more than 15 minutes throughout the work day, their exposures will usually fall below the AL of 25 µg/m3 as an 8-hour TWA under all foreseeable conditions; when that is the case, these employees will not be covered by the standard.

If all of the jobs and tasks an employer performs are included on Table 1, can the employer comply with Table 1 exclusively, instead of following alternative exposure control methods?

<u>Yes</u>. Most of the tasks that generate exposure to silica in construction are listed on Table 1, and OSHA anticipates that most employers will choose to follow Table 1 for tasks listed on the table.



For a few tasks on Table 1, respirator requirements vary based on task duration, i.e., whether the task is performed for "less than or equal to four hours/shift" or "greater than four hours/shift." Does the employer have to track the exact amount of time that employees are performing a job throughout a shift to be in compliance with Table 1?

<u>No</u>. Before the task is performed, the employer must make a <u>good-faith</u> judgment about whether the task will take more than four hours. This judgment should be based on previous experience and other available information.

Are handheld powered demolition hammers with bushing tools covered by Table 1?

Yes. OSHA considers handheld powered demolition hammers with bushing tools to be a type of handheld powered chipping tool. Therefore, employers of employees using handheld powered demolition hammers with bushing tools can follow Table 1 by <u>fully and properly implementing the engineering controls,</u> <u>work practices, and respiratory protection</u> specified in Table 1 paragraph (c)(1)(x).



Are tile saws covered by Table 1?

OSHA considers handheld tile saws to be handheld power saws, for purposes of Table 1 (paragraph (c)(1)(ii)). OSHA considers stationary tile saws to be stationary masonry saws, also covered by Table 1 (paragraph (c)(1)(i)). Employers of employees using these types of tile saws can follow Table 1 by <u>fully and properly</u> <u>implementing the engineering controls and work practices in the specified paragraphs.</u>



OSHA's National Emphasis Program-Respirable Crystalline Silica

https://www.osha.gov/sites/default/files/enforcement/ directives/CPL_03-00-023.pdf

- On February 5, 2020 OSHA Revised their NEP to Reduce or Eliminate Worker Exposure to Silica
 - This NEP targets the specific industries expected to have the highest number of workers who exposed to Silica



Specific Industries Expected to have the Highest Number of Workers Exposed to Silica

- During fabrication and installation of composite stone countertops
- Excavation, earth moving and drilling plant operations
- Clay and stone processing machine operations
- Mining, quarrying and mineral ore treating processes
- Tunnelling
- Construction labouring activities
- Brick, concrete or stone cutting; especially using dry methods
- Abrasive blasting
- Foundry casting
- Angle grinding, jack hammering and chiselling of concrete or masonry
- Hydraulic fracturing of gas and oil wells



OSHA's Inspection Procedures for Respirable Crystalline Silica Standards https://www.osha.gov/sites/default/files/enforcement/ directives/CPL_02-080.pdf

- CPL 02-02-080, Inspection Procedures for the Respirable Crystalline Silica Standards, June 25, 2020
- This is OSHA's "playbook" for conducting uniform field inspection and enforcement procedures



OSHA's Inspection Procedures for Respirable Crystalline Silica Standards

Notable items from this document include;

- Different methods now exist for measuring the PEL based on air sampling data
- Objective data has very specific requirements in order to used
- Detailed guidance for the Compliance Officer to take air samples
- Specific criteria for the Compliance Officer to write citations



Questions

