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Heavy Civil Construction Safety
Part 5. Respirable Crystalline Silica in Construction

by

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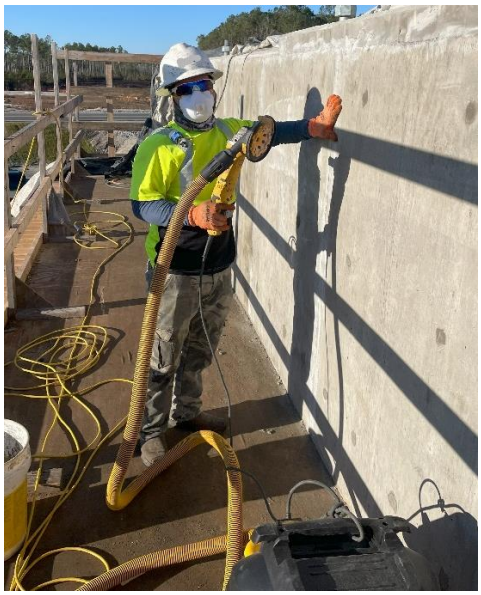

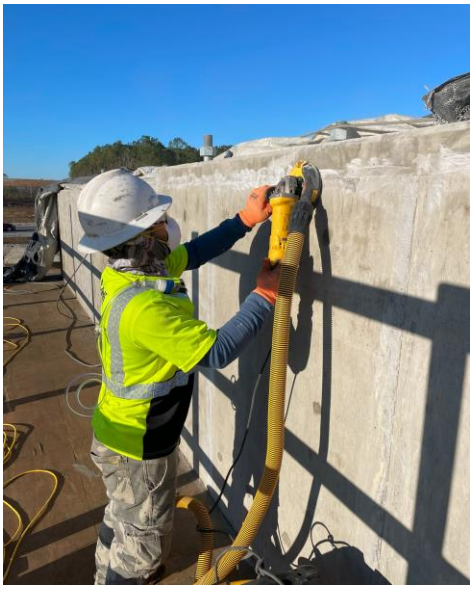

Introduction

Welcome to this PDH course on Construction Safety. This is the Fifth Part of this series. If interested, please consider taking the previous courses for a better understanding of the series format. Hopefully, you will find the courses interesting and informative. It is the intent of the course to provide the reader with a sound knowledge base of the fundamentals of safety so they can be considered one of the Industry's Competent Safety Personnel. Supervisory engineering responsibilities require this type of training so leaders can help the staff they oversee to avoid accidents.

The series of courses will attempt to make this material easy to read and understand. It does not go into any depth on technical subjects but will provide enough material for the reader to be aware of the basics in a wide variety of subject areas. Some topics may not directly affect a present job, but it is important to become well rounded in all safety areas and to understand why certain things are done for better safety.

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Course Topics of this series may include:
General OSHA and MSHA Responsibilities, Personal Protection, Hand and Power Tools, Ladders and Scaffolds, Excavation and Trenches, Equipment Operations, Crane Safety, Rigging Safety, Traffic Control, Fire Protection, & Equipment Transporting.
Welcome to this PDH course on Silica Fume Exposure and Safety. If interested, please consider taking the previous courses for a better understanding,

The goal of this fifth course is to review Silica in Construction and the new safety requirements for work exposed to silica. The material will include general discussions of the various tools available and some of the hazards/precautions needed to safely work around a silica exposure. Anyone who works around heavy construction knows that there are hazards involved in this type of work and that they are not to be taken lightly. It is not the purpose of this course to teach people to be a certified silica competent person. It is the purpose to teach people safe practices and procedures to reduce the chance of silica exposure hazards.

General

Respirable Crystalline Silica in Construction

The information for this course has been gathered from personal experience and training but much of it has been supplemented from the OSHA.gov website on crystalline Silica in Construction, the provided tables are directly copied from the website:

https://www.osha.gov/silica-crystalline/construction

For further and more in-depth information it is recommended the reader visit this site or consult other sites available from OSHA.

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The objective of this course is to provide an Introduction to the new Silica Exposure Standards, to Understand the ways we are exposed to Silica in construction, to Understanding the potential health hazards of Respirable Crystalline Silica Exposure (RCS), and to detail the Exposure Control Methods and Medical Surveillance

Recently OSHA (the Occupational and Health Safety Administration) has adopted a new standard for respirable crystalline silica across all industries. The OSHA Standard which applies to Respirable Crystalline Silica in Construction is 29 CFR 1926.1153. The construction standard went into effect on September 23, 2017.

The New Construction Standard:

The standard applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 µg/m3 (action level) as an 8-hour Time-Weighted Average under any foreseeable conditions.

Highlights of the new standard include:

- A competent person is required for silica related work
- There is a new established Action Level (AL)
- There is a new Permissible Exposure Limit (PEL)
- A table of 18 silica generating tasks (Table 1) has been developed to assist with exposure prevention and compliance
- A written exposure control plan is required
- Engineering controls are mandatory
- Dry sweeping and air cleaning are prohibited in most cases
- Medical evaluations are required for certain workers
- Training is required for workers

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NEW Exposure Limits

The new exposure limits have set an Action Level at 25 micrograms per cubic meter of air (25 µg/m3). The old standard had a Permissible Exposure Limit (PEL) of 100 micrograms per cubic meter of air for general industries and 250 micrograms per cubic meter of air for the construction and shipbuilding industries. The new standards have lowered this amount to 50 micrograms per cubic meter of air (50 µg/m3). This exposure limit amount is the highest level of Respirable Crystalline Silica (RCS) in the air to which you may be permissibly exposed to over an 8-hour workday.

Where can crystalline silica be found?

Crystalline silica is an essential component of materials that have an abundance of uses in industry. The main industries that use crystalline silica include **Construction,** Glass Manufacturing, Foundries, Ceramics Manufacturing, and Chemical Plants

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What is Respirable Crystalline Silica?

Respirable Crystalline Silica is often referred to as RCS. We want to prevent the respirable dust fraction of silica from entering our body when high levels are present. The respirable dust fraction is the proportion of airborne particle that enters the body through inhalation and penetrates to the pulmonary alveolar region of the lungs. Respirable crystalline silica particles are tiny, measuring only a few microns in diameter. That's much smaller than a grain of sand.

Exposure Routes

Most commonly, Silica Inhalation by breathing in silica dust from operations. Secondly by Ingestion. Swallowing silica dust during eating or drinking in an area where the dust is present; or the dust is on your hands or face while eating or drinking; or applying chap stick as examples.

From OSHA's Website the major Health Risks are as follows:

Health Effects – Silicosis
Silicosis is a lung disease which is disabling and can be fatal when it leads to lung cancer. There have been greater than 14,000 deaths since 1968 from Silicosis. Greater than 200 deaths per year in the United States alone.
Silcosis is diagnosed as:

- **Chronic**
  - Occurs after 20 to 40 years of moderate to low exposure
- **Accelerated**
  - Occurs 5 to 15 years of very high exposures
- **Acute**
  - Occurs within weeks or as long as 2 years to extremely high concentrations

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Health Effects – Others

Other health problems from RCS include:

- Lung Cancer
- Higher Risk of Tuberculosis
- If exposed to TB
- Chronic obstructive pulmonary disorders
- Bronchitis, Emphysema
- Kidney disease
- Stomach Cancers
- To a less extent there is some concern chronic exposure could lead to immunologic disorders & autoimmune diseases

Exposure Sources

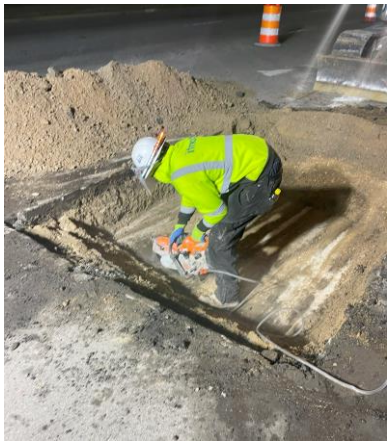
In construction there are many operations that can generate RCS. Some operations that generate respirable crystalline silica include: Cutting, sawing, grinding, drilling, busting, chipping, milling, hammering, and crushing stone, rock, concrete, brick, block, mortar, and asphalt. The blast media used for abrasive blasting with sand is a source of RCS and as it is used it will create an exposure, as well as, abrasive blasting on silica containing materials like stone, rock, concrete, brick, block, etc. Dry sweeping or

blowing dust that contains silica will further disturb the generated RCS and create an even greater exposure from the above listed operations.

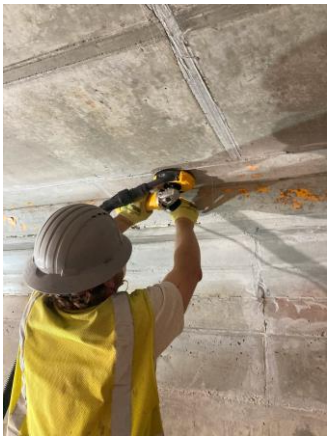
Exposure Control Methods

Using engineering controls to remove the exposure is the preferable method of mitigating RCS exposure to workers. Replace any material sources of silica with alternate materials that do not contain silica.

- Replacement - use products that do not contain silica
- Removal – relocate or set-up a barrier from other trades or the public
- Engineering controls – wet methods, dust extraction, sweeping controls
- Administrative – reduce employee exposure times
- Respiratory Protection - respiratory program, medical clearance, training and fit test



Wet methods



dust extraction

reduce employee exposure

Complying with the New Standard - Exposure Controls

- Employers must use specified exposure control methods in **Table 1**; or

- Employers that conduct tasks not listed in Table 1 or do not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1 of the specified exposure control methods approach must follow the **alternative exposure control methods** approach.

Table 1—Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(ii) Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)	For tasks performed outdoors only: Use saw equipped with commercially available dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency	None	None
(iv) Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	-When used outdoors	None	None
	-When used indoors or in an enclosed area	APF 10	APF 10
(viii) Dowel drilling rigs for concrete	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	APF 10	APF 10
	Use a HEPA-filtered vacuum when cleaning holes		
(ix) Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector	None	None
	OR		
	Operate from within an enclosed cab and use water for dust suppression on drill bit	None	None

(v) Drivable saws	For tasks performed outdoors only:		
	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(vi) Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use 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 Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism Use a HEPA-filtered vacuum when cleaning holes	None	None
(x) Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
	OR		
	Use tool equipped with commercially available shroud and dust collection system		
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
(xi) Handheld grinders for mortar removal (*i.e.*, tuckpointing)	Use grinder equipped with commercially available shroud and dust collection system	APF 10	APF 25
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism		

(xii) Handheld grinders for uses other than mortar removal	For tasks performed outdoors only: Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface	None	None
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	OR		
	Use grinder equipped with commercially available shroud and dust collection system		
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism:		
	-When used outdoors	None	None
	-When used indoors or in an enclosed area	None	APF 10
(xiii) Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface	None	None
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	OR		
	Use machine equipped with dust collection system recommended by the manufacturer	None	None
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism		
	When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes		
(xiv) Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant	None	None
	Operate and maintain machine to minimize dust emissions		
(xv) Large drivable milling machines (half-lane and larger)	For cuts of any depth on asphalt only: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust	None	None
	Operate and maintain machine to minimize dust emissions		
	For cuts of four inches in depth or less on any substrate:		
	Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust	None	None
	Operate and maintain machine to minimize dust emissions		
	OR		
	Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant	None	None
	Operate and maintain machine to minimize dust emissions		

(xvi) Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points)	None	None
	Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions		
	Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station		
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (*e.g.*, hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab	None	None
	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions	None	None
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions	None	None
	OR		
	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab	None	None

Table 1- Information

2. Determine what additional requirements you must meet under the standard, based on the compliance method you are following.

	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

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OSHA's preferred method. OSHA expects most contractors to follow table 1.

- 18 Tasks/Tools used in construction for silica related work.
- The information under each task is different. You must read all the information.
- Some entries contain information on multiple engineering controls.
- The table has notes that must be considered. These notes specify additional information on controls and methods to meet compliance.
- Reading the table:
    - **1st Column** lists the ***Equipment or Task***
    - **2nd Column** lists the ***Engineering and Work Practice Control Methods***
        - **These have to be fully and properly implemented to meet the exposure control requirements**
    - **3rd and 4th Columns** list the ***Required Respiratory Protection***
        - Required means each employee must be enrolled in our Respiratory Protection Program.
        - Must determine hours expected to be exposed before work begins.

Table 1 – Example (Task 1)

TABLE 1: Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica

Equipment/Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours/shift	> 4 hours/shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None

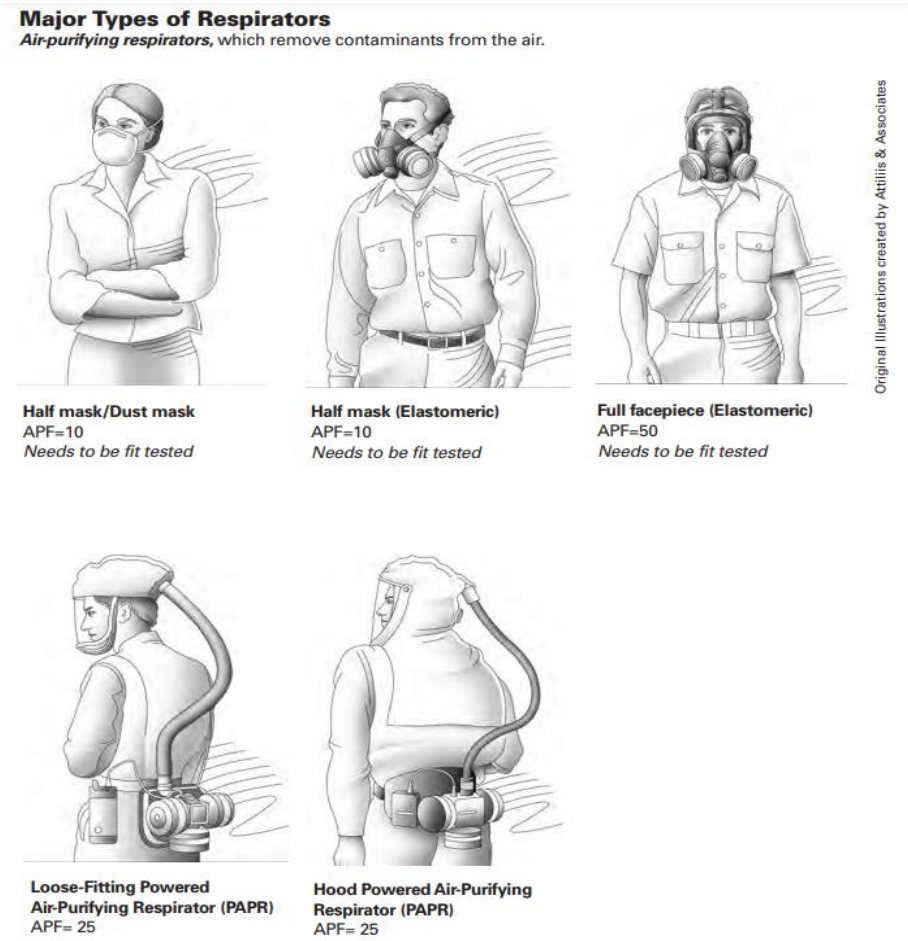
Column 1 Column 2 Column 3 Column 4

Table 1 – Task 1 – Example cont.

- Note for this task that the engineering controls require integrated water on the saw that continuously feeds water to the blade
- Note for this task that the tool must be maintained
- Note for this task that no respirator is requires for less than 4 hours or more than 4 hours.

Respiratory Protection Levels

- Assigned Protection Factor (APF) is the work place level of respiratory protection that the respirator is expected to provide.



https://www.osha.gov/sites/default/files/publications/3352-APF-respirators.pdf
OSHA Publicattion – Assigned Protecttion Factors for the Revised Respiratory Protection Standard

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Respiratory Protection

Personal Respiratory Protection is a difficult subject, and it will not be covered in great depth because of how involved it is. Important things to remember as a supervisor will be covered only. Any safety measures should be addressed specific to the exposure and should be coordinated with all personnel what procedures will be needed. If there is any exposure to excessive dust, some type of respiratory protection will be required. This may involve cartridge respirators, or air supplied respirators, or simply dust masks. They're very different and serve specific purposes. Just because someone has something over their mouth and nose doesn't mean they are protected.

We learn about the need for respiratory protection from material safety data sheets (MSDS) and reviews of the specific exposed operations. Every attempt should be made

to uncover operations where protection is necessary. Certainly, very dusty areas, or other areas where there are strong chemical odors should be looked at. For exposure questions, consult with experienced workers because conditions may change from job to job and the staff may not be aware of an exposure. For instance, outside work rarely needs to provide respiratory protection for welding and cutting, and yet, if welding occurs on lead paint coated steel, or with zinc-based filler materials, substantial respiratory protection is needed.

Some things for you to remember include:

1. Ask your supervisor if you have any questions about the need and type of respiratory protection for your work.
2. If equipment is necessary, make sure it is worn.
3. Fit tests are required for workers who must wear respiratory protection for any length of time. Arrangements will be made for respirator users to be fit tested. All should read the instruction provided on the equipment and relay that information to any workers. A proper fit is necessary, each type of respirator will come with instructions.
4. If respirators are necessary, they must be cleaned regularly and stored where they won't get dirty. They must be checked routinely for defects or cracks, which can occur when the rubber face piece dries out.
5. This is a tough one, workers who wear respirators cannot have beards. A proper fit test cannot be performed with beards.
6. Do not use someone else's respirator without disinfecting it.
7. Workers with asthma or heart conditions should not wear respirators without a doctor's approval. Some cases may require lung capacity tests before starting work with respirators. It may also be advisable not to allow employees to wear respirators with a severe cold or flu.

Lastly and Most Importantly! Personal Protective Equipment is the "Last Line" of defense to safeguard employees from hazards. The "First Line" is to engineer a

solution that eliminates the hazard and provides a safe workplace with no exposure. Do not rely on the effectiveness of an employee's personal protective equipment if an alternate means of construction can be utilized.

Respiratory Protection When Performing Multiple Tasks

Examples of Respiratory Protection Requirements for Employees who do more than one Table 1 Task

1. An employer anticipates that an employee will use a handheld grinder on a concrete wall outdoors for 3 hours and then use a chipping hammer outdoors for 2 hours (total Table 1 task duration of 5 hours per shift). The employer looks in the "> 4 hour/shift" column for each task to determine that no respiratory protection is required during use of the handheld grinder outdoors, but a respirator with an APF of 10 is required during use of the chipping hammer outdoors.
2. An employer anticipates that an employee will use a stationary masonry saw to cut bricks for 1 hour and use a handheld power saw to cut concrete indoors for 1 hour over the course of a shift (total Table 1 task duration of two hours per shift). The employer looks in the "≤ 4 hour/shift" column for each task to determine that no respiratory protection is required during use of the stationary masonry saw, but a respirator with an APF of 10 is required during use of the handheld power saw indoors.
3. An employer anticipates that an employee will drive a half-lane milling machine for 4 hours and then operate a walk-behind milling machine equipped with an integrated water delivery system for 4 hours (total Table 1 task duration of 8 hours). The employer looks in the "> 4 hour/shift" column for each task to determine that no respiratory protection is required for either task.

When you cant use Table 1…

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Alternate Exposure Control Methods

In workplaces where tasks aren't covered by Table 1 or when opting not to adhere to its guidelines, alternative exposure control methods must be implemented to ensure that

no employee is subjected to RCS exposure levels exceeding the permissible exposure limit (PEL) of 50 µg/m³ averaged over an 8-hour time-weighted average (TWA). This necessitates a thorough assessment of the exposure for every employee expected to encounter or potentially exceed the action level of 25 µg/m³. Two primary methods for this assessment are outlined: the Performance Option and the Scheduled Monitoring Option.

Under the Performance Option, the exposure of each employee is evaluated based on an 8-hour TWA exposure. This evaluation relies on a combination of air monitoring data and objective information, ensuring an accurate characterization of employee exposure levels.

Alternatively, the Scheduled Monitoring Option involves conducting initial monitoring to gauge the 8-hour TWA exposure of each employee. This is achieved through one or more personal breathing zone samples that accurately reflect the exposures across different shifts, job classifications, and work areas.

Following the initial monitoring, specific actions are dictated based on the recorded exposure levels:

- If initial monitoring reveals exposure levels below the action level, further monitoring can be discontinued.
- If recent monitoring indicates exposure levels above the action level but below the PEL, monitoring must be repeated within six months.
- In cases where recent monitoring shows exposure levels surpassing the PEL, monitoring should be repeated within three months.

Furthermore, when subsequent (non-initial) monitoring results fall below the action level, the process must continue with monitoring repeated within six-month intervals until two consecutive measurements, taken at least seven days apart, register below the action level. Only then can monitoring be discontinued.

These comprehensive measures ensure diligent monitoring and management of RCS exposure, safeguarding the health and safety of all employees in the workplace.

Air Sampling Equipment

To accurately assess exposure levels in the workplace, personal air sampling equipment is employed. This includes the use of a personal air sampling pump paired

with a cyclone collection system, which is designed to capture and analyze the airborne contaminants that workers may be exposed to. The use of this equipment ensures precise monitoring of respiratory hazards, particularly respirable crystalline silica, allowing for timely intervention if exposure exceeds safety thresholds.

Reassessment of Exposures

It is critical to reassess workplace exposures whenever any changes in the production process, control equipment, or work practices occur. These changes may reasonably be expected to lead to new or additional exposure risks, especially if they push exposure levels to or above the action level for respirable crystalline silica. This reassessment ensures that any new risks are promptly identified and controlled, maintaining a safe working environment for employees. Similarly, if there is any suspicion that such exposures have occurred, the workplace must be reassessed to confirm whether the levels are above the action level and to implement corrective measures if necessary.

Employee Notification

Once exposure assessments have been completed, employees must be notified of the results in writing. This notification will occur within five working days and will either be delivered directly or posted in a common area. If the results show that exposure levels exceed the permissible exposure limit (PEL), the notification will include details about the corrective actions being implemented to address the hazard and reduce exposure levels. This transparency ensures that employees are informed about potential risks and the measures being taken to protect their health.

Additional Compliance Requirements

Competent Person

A key component of the exposure control plan is the designation of a competent person. This individual must be identified in the written exposure control plan and should possess the expertise and authority to identify both existing and potential respiratory hazards associated with crystalline silica. The competent person is empowered to take immediate and appropriate corrective actions to mitigate any risks, ensuring that workers are protected from harmful exposure levels.

Written Exposure Control Plan

Every task performed in the workplace should be addressed in the written exposure control plan, with reference to Table 1 for specific guidelines. The plan must outline necessary engineering controls, work practices, and the use of personal protective equipment, including respirators. It should also include maintenance instructions for tools and equipment used in silica-related tasks. Additionally, the plan must detail housekeeping procedures to minimize dust exposure, and it should include protocols to restrict access to areas where silica exposure is present, especially when other employees are involved. The plan must be evaluated annually and updated as needed to ensure ongoing effectiveness. Importantly, the plan must be made readily available to all employees, and a designated competent person must be tasked with its implementation.

Housekeeping

Proper housekeeping is essential to control silica exposure in the workplace. Dry sweeping or dry brushing to clean surfaces is strictly prohibited, as it can stir up dust and increase exposure. Instead, wet sweeping or the use of HEPA-filtered vacuums should be employed to effectively minimize dust. The use of compressed air to clean surfaces or clothing is also prohibited, unless it is part of a ventilation system that

effectively captures and filters the resulting dust cloud. These measures help maintain a cleaner and safer environment, reducing the risk of airborne silica exposure.

Medical Surveillance

For employees who are required to wear a respirator for 30 or more days per year to protect against silica exposure, medical surveillance is required. This includes regular medical examinations and procedures conducted by a licensed healthcare provider (PLHCP). These exams are required at least once every three years, or more frequently if recommended by the PLHCP, to ensure that employees remain fit for duty and to identify any potential health issues related to silica exposure early on.

Training

Employees must receive training on silica hazards and the associated health effects as part of compliance with OSHA standards. This training should cover the potential dangers of respirable crystalline silica, the measures outlined in the written exposure control plan, and the appropriate steps to take to minimize exposure. Regular training ensures that employees understand the risks and are equipped with the knowledge to protect themselves from harmful exposure, thereby fostering a safer workplace.

CONCLUSION

Silica in construction has been a hazard for years and until recently, has not received the attention of the industry needed to protect exposed personnel from the related hazards. OSHA's new standards have provided the minimum guidelines for correcting this oversight. Many industry professionals have been slow to make the changes because they don't wish to change their old habits or they question the necessity. This mentality is unacceptable. Just as our predecessors ultimately adopted the hardhat as

a requirement of employee protection, we must change our operations and mindset towards protecting everyone from silica exposures and create a safe working environment in construction.

As previously stated, this is the fifth course in a proposed series on Construction Safety. The series of courses offer only a brief introduction to each topic and do not offer or imply any type of certification or level of expertise upon completion. For a better understanding, the reader should consider getting their OSHA 10-hour and OSHA 30-hour Construction Safety and Health Card by successfully completing OSHA recognized Classes.

Lastly, safety must be a constant focus of every operation. Because of the variability of Heavy Civil Construction Projects, they are often chosen to be constructed in some of the most adverse and inaccessible areas imaginable. Working with extreme weights, at excessive heights, in adverse conditions, and around large equipment requires safety diligence from every stakeholder. Personal protective devices must be worn at all times. **Please be safe**.