

**SUNY GENESEO**  
**ENVIRONMENTAL HEALTH & SAFETY**

<b>Procedure No.: EHS 004</b>	<b>Date: November 30, 2022</b>
<b>Title: Silica Exposure Control Plan</b>	<b>Approved by: Bob Ames, AVP Facilities and Planning</b>
<b>Revision No.: new</b>	<b>Page 1 of 11</b>
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**Exposure Control Plan – Respirable Crystalline Silica**

**I. PURPOSE**

This Exposure Control Plan (ECP) was established to ensure employee exposures to respirable crystalline silica are minimized to safe or negligible levels, and to comply with OSHA/PESH requirements. This requires employers to:

- Use engineering controls (e.g., water, ventilation) to limit worker exposure to respirable silica dust to at or below the permissible exposure limit (PEL).
- Provide respirators when engineering controls cannot adequately limit exposure.

Workers exposed to respirable crystalline silica are at increased risk of developing serious adverse health effects including, but not limited to: silicosis, lung cancer, chronic obstructive pulmonary disease (COPD), and kidney disease.

**II. SCOPE & REQUIREMENTS**

This Exposure Control Plan was developed to ensure airborne levels of respirable crystalline silica remain below regulatory thresholds during construction activities. This goal is accomplished through the following:

- Providing respiratory protection when required.
  - Restricting housekeeping practices that expose employees to respirable crystalline silica when possible and employing less-dangerous/hazardous alternatives when possible.
- Establishment and implementation of a written Exposure Control Plan, including designation of competent person(s).
- Offering silica-specific medical exams to employees who will be required to wear a respirator under the standard for 30 or more days per year and maintaining these medical records for the designated length of time.
- Communication of associated hazards and sufficient training of employees.

### III. DEFINITIONS

For the purpose of this document, the following definitions apply:

**Action Level:** a concentration of airborne respirable crystalline silica of  $25 \mu\text{g}/\text{m}^3$ , (micrograms per cubic meter) calculated as an 8-hour time-weighted average (TWA) that once exceeded, initiates certain required activities such as exposure monitoring and medical surveillance.

**Competent Person(s):** an individual(s) 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(s) must have the knowledge and ability necessary to fulfill the responsibilities set forth in 29CFR 1926.1153(g)(4).

**Crystalline Silica:** also called silicon dioxide ( $\text{SiO}_2$ ), a common mineral found in many naturally occurring and man-made materials used at construction sites (e.g., sand, concrete, brick, block, stone, and mortar). Amorphous silica (i.e., silica gel) is not crystalline silica.

**Permissible Exposure Limit (PEL):** “the level of exposure established as the highest level of exposure an employee may be exposed to without incurring the risk of adverse health effects.” For respirable crystalline silica, the PEL is  $50 \mu\text{g}/\text{m}^3$  as an 8-hour TWA. This means that over the course of any 8-hour work shift, exposures can fluctuate but the average exposure over those 8 hours to respirable crystalline silica cannot exceed  $50 \mu\text{g}/\text{m}^3$ . Following the Table 1 requirements, reduces employee exposure to less than the PEL.

**Respirable crystalline silica:** very small particles of silica, typically greater than 100 times smaller than ordinary sand found on beaches or playgrounds, that is generated by high-energy operations (e.g., cutting, sawing, grinding, drilling and crushing stone, rock, concrete, brick, block, mortar) or when abrasive blasting with sand.

**Silicosis:** a disabling, irreversible, and sometimes fatal lung disease caused by the inhalation of respirable crystalline silica dust, usually over many years. When a worker inhales crystalline silica, the lungs irreversibly react by developing hard nodules and scarring around the trapped silica particles. If nodules become too large, breathing becomes difficult and death can result. There is no known cure for the disease, but it is 100% preventable.

#### IV. RESPONSIBILITIES

**Facilities Administration:** ensure that work groups have the necessary funding for equipment and medical examinations as required under the silica standard, 29 CFR 1926.1153.

**Environmental Health and Safety Office (EHS):** assist the Facilities sub-groups in complying with the applicable regulations and this program. EHS will provide training or obtain outside training providers for silica safety and keep copies of training records. EHS will also conduct respirator training and fit testing.

**Facilities Planning Office (FPO):** provide orientation to outside contractors, under their purview, regarding silica safety to reduce potential exposure to our faculty, staff, and students by:

- Providing this Exposure Control Plan, if warranted.
- Holding accountable any contractors found in violation of this plan.

*Note: SUNY Geneseo will not provide training, PPE, or equipment to contractors.*

**Supervisors of Employees:** ensure employees follow the elements outlined in this Exposure Control Plan and hold accountable any employees found to be in violation of it.

**Affected Employees:** are required to abide by the elements outlined in this Exposure Control Plan. Affected employees will not use defective equipment or equipment not outfitted with proper engineering controls as outlined in Table I.

#### V. PROCEDURES

**Engineering, Work Practice, and Administrative Controls:** SUNY Geneseo has decided to follow the engineering controls in Table 1 contained within 29 CFR 1926.1153<sup>ii</sup> (below) to keep affected employees at or below the permissible exposure limit of 50  $\mu\text{g}/\text{m}^3$  as an 8-hour time-weighted average (TWA) for respirable crystalline silica.

For each employee engaged in a task identified on Table 1, the employer shall fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, unless the employer assesses and limits the exposure of the employee to respirable crystalline silica in accordance with paragraph (d) of this section.

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
(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
(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
(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
(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 tasks will likely generate appreciable amounts of airborne respirable silica if engineering controls are not used. Several tasks performed by our employees that are not in Table 1 e.g. wet cutting with a tile saw, manual mixing of concrete and drilling into a wall, are not expected to yield airborne concentrations which exceed the PEL according to OSHA interpretation letter dated 7/25/19.

Although SUNY Geneseo does not foresee performing any other tasks outside of those listed in Table 1, if, for any reason, there may be tasks not covered, alternative control methods will be used to control exposures below the PEL, which may include the following: wet methods, ventilation, and enclosures. The employee's exposure levels will be assessed by performing periodic air monitoring to ensure employees stay below the PEL.

**Protective Measures while Working:** measures to keep respirable crystalline silica dust to a minimum while performing job tasks the operator will:

**Water:**

- Ensure a there is enough water before starting to cut, when Table 1 calls for the use of an integrated water delivery system.
- Ensure there is steady stream of water delivered to the cutting edge.
- Check the operation of water nozzles to make sure they are not plugged.
- Ensure hoses are not kinked or bent while working.
- Change the water when needed to maintain the flow of water to the blade.
- Obtain a portable tank and pump to be used as a water supply if a water supply is not available from a nearby building.

**High-Efficiency Particulate Air [filter] (HEPA) Vacuum:**

- Provide a means of exhaust, as needed, to minimize the accumulation of visible airborne dust for tasks involved indoors or enclosed spaces.
- Check shrouds to ensure proper fit prior to working.
- Ensure hoses are not kinked or bent while working.
- Ensure that a filter cleaning mechanism is on the vacuum so the filter does not get clogged.
- Use the switch on the vacuum to activate the filter cleaning at a frequency recommended by the manufacturer.
- Replace vacuum bags as needed to prevent overfilling.
- Ensure that used vacuum bags are to be placed in labeled "respirable crystalline silica" plastic bags and sealed prior to disposal.

**Affected Employees:** employees who are not directly involved in the generation of respirable crystalline silica dust but may be indirectly involved in the operation (e.g., person directing traffic), must be positioned away from and upwind of the dust generation.

**Equipment Types:** the following equipment stipulations are required:

- HEPA vacuum must have 99% efficiency.
- Respirators must have an assigned protection factor of 10. This could be an N100 or half-face respirator with HEPA filters.

**Restricted Work Areas:** when respirable crystalline silica dust is being created, the worker/operator needs to protect themselves and the public by:

- Limiting the number of employees exposed to respirable crystalline silica.
- Scheduling tasks when others are not around, if possible.
- Telling employees and bystanders not associated with the work to leave the area where respirable crystalline silica dust is being generated.
- Posting warning signs.

*Note: in all cases, stop work to reassess the operation if there is an increase in visible dust and adjust controls as necessary to reduce the volume of dust.*

## VI. HOUSEKEEPING

The hierarchy of cleaning is as follows, from **most preferred to least preferred**:

1. Vacuuming with a HEPA vacuum.
2. Wet wiping of surfaces.
3. Wet sweeping.

When cleaning up silica containing dust, employees must **not** clean:

- By dry brushing and dry sweeping. Only HEPA vacuuming, wet wiping, and wet sweeping are allowed.
- Surfaces or clothing with compressed air, unless the compressed air is used together with a ventilation system that effectively captures the dust cloud or no other cleaning method is feasible.

It is preferable that a wet saw (or similar) be cleaned up before it dries using a wet/dry vacuum with a HEPA filter. If a slurry dries, wet it down again, then use a wet/dry vacuum with a HEPA filter.

It is not necessary to follow these housekeeping requirements when cleaning ordinary soil, large debris, and non-respirable crystalline silica-containing materials (e.g., sawdust).



## **VII. COMPETENT PERSON(S)**

Persons deemed competent of recognizing silica hazards and having the authority to take corrective measures are persons with the following titles:

- Maintenance Supervisor 2
- Assistant Director Facilities
- Associate Director Facilities
- EHS Specialist
- Director EHS
- Assistant Director Facilities and Planning
- Director Facilities and Planning

The competent person(s) must frequently and regularly inspect job sites, materials, and equipment to implement the Exposure Control Plan.

## **VIII. MEDICAL SURVEILLANCE**

Medical surveillance is required for respirator users and may be required for those exposed to respirable crystalline silica to:

- Determine the employee's suitability to wear a respirator.
- Determine if an employee has any condition (e.g., lung disease) that makes them more sensitive to respirable crystalline silica exposure.
- Identify silica-related diseases so employees with those diseases can take further action to protect their health.

### **Silica Employees:**

Per 29 CFR 1926.1153(h), employers must make silica-specific medical examinations available to employees who will be required to wear a respirator for 30 or more days per year in the next 365 days as outlined in the silica standard, 29 CFR 1926.1153. If the employee is required to wear a respirator at any time during a day, for however brief, that counts as one full day of respirator use.

When unexpected circumstances result in employees being required to wear respirators more frequently than first expected, employers must make medical surveillance available as soon as it becomes apparent that the employee will be required by the silica standard to wear a respirator for 30 or more days in the next 365 days.

Initial exams must be offered within 30 days of initial assignment to individuals who are expected to wear a respirator 30 or more days throughout the next 365 days. Periodic exams must be offered within three years of the last examination unless advised differently by the medical professional.

**Respirator Wearers:**

A respirator-specific medical evaluation by a physician or other licensed healthcare professional is required before an employee is fit tested for a respirator or wears a respirator.

If an employee will need both a silica exam and a respiratory exam, they may be given at the same time.

**Written Medical Opinion:**

A written medical opinion of the employee's suitability for respirator use, authorized by the employee receiving the exam, must be provided to the employer by the medical professional. If the employee elects to not share the results, the employer will not be responsible for covering the costs of the exam and the employee's suitability for the task to be completed may be reassessed.

**IX. RESPIRATORY PROTECTION**

Respirators will be used where required under Table 1, or where required under another applicable OSHA standard (e.g., blasting with silica sand).

Respirators must have an assigned protection factor (APF) of at least 10. This could be an N100 or half-face respirator with HEPA filters. For more information on respiratory issues, refer to the SUNY Geneseo Respiratory Protection Program<sup>iii</sup>.

All users of respirators are included in the Respiratory Protection Program, with the exception of voluntary use of filtering face piece respirators.

**X. TRAINING**

Employees have access to Safety Data Sheets (SDS) and are trained in accordance with the provisions of Hazard Communication Standard<sup>iv</sup> and the following topics:

- Health hazards associated with exposure to respirable crystalline silica (i.e., cancer, lung effects, immune system effects, and kidney effects).
- Specific tasks in the workplace that could result in exposure to respirable crystalline silica.
- Specific engineering controls, work practices, and respiratory protection implemented for protection against exposure to respirable crystalline silica.
- The contents of the respirable crystalline silica standard.
- The identity of the designated competent person(s).
- The purpose and description of the medical surveillance program.

## **XI. RECORD RETENTION**

29 CFR 1910.1020<sup>v</sup> outlines that certain records be maintained, including: air monitoring data, objective data, and medical surveillance records. These records are accessible to employees, their representatives, and OSHA and PESH for 30 years (air monitoring & objective data) or 30 years plus the length of employment (medical records) because some related illnesses (e.g., cancer) may not be detected until several decades after exposure.

## **XII. ANNUAL REVIEW**

A yearly review of this Exposure Control Plan is necessary to make sure that all information is up to date. New equipment and tasks involving exposure may need addressing.

## **XIII. REFERENCES**

- 29CFR 1926.1153, Federal Occupational Safety and Health Administration (OSHA)
- OSHA Small Entity Compliance Guide for the Respirable Crystalline Silica Standard for Construction 2017
- Public Employee Safety and Health (PESH) Draft Silica Plan
- Bosch catalog: OSHA compliant dust solutions

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<sup>i</sup> <https://www.osha.gov/laws-regs/standardinterpretations/1995-10-06-3>

<sup>ii</sup> <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1153>

<sup>iii</sup> [https://www.geneseo.edu/sites/default/files/sites/ehs/Respiratory%20Protection%20\(6\).pdf](https://www.geneseo.edu/sites/default/files/sites/ehs/Respiratory%20Protection%20(6).pdf)

<sup>iv</sup> [https://www.geneseo.edu/ehs/haz\\_com\\_right-to-know](https://www.geneseo.edu/ehs/haz_com_right-to-know)

<sup>v</sup> <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1020>