



29.0 Crystalline Silica Exposure Program

1.0 OBJECTIVE

The Crystalline Silica Exposure Control Plan applies to Hausmann Construction, Inc. personnel who are potentially exposed to concentration levels of respirable crystalline silica (silica) that are above 50 micrograms per cubic meter of air, in a 8-hour time-weighted average (TWA). This Plan also applies to Hausmann Construction, Inc. superintendents, foremen, or safety personnel who may be responsible for overseeing a subcontractor's operations that have the potential to become exposed to concentrated levels of silica at or above regulatory permissible exposure limits.

2.0 PURPOSE

The purpose of this procedure is to provide safe guidelines for construction activities that involve any level of exposure to crystalline silica (silica), and to protect individuals that may be exposed to concentration levels of respirable crystalline silica that are above regulatory permissible exposure limits during workplace activities for the durations established by OSHA regulations.

3.0 SCOPE

This program describes the hazards associated with material and activities that could potentially create exposure to concentrated levels of silica. Protection from these hazards and materials are required throughout Hausmann Construction projects. These projects include, but are not limited to:

- **Brick:** Tasks that involve the activities including bush hammering, cutting/sawing, demolishing/disturbing, drilling/coring, grinding, jackhammering, and sweeping/housekeeping activities that may create exposure to materials containing silica.
- **Cement:** Tasks that involve construction activities that include mixing/pouring, sacking/patching, and sweeping/housekeeping activities that create exposure to materials containing silica.
- **Concrete:** Tasks that involve the activities including bush hammering, cutting/sawing, demolishing/disturbing, drilling/coring, grinding, jackhammering and sweeping/housekeeping activities that may create exposure to materials containing silica.
- **Concrete Block:** Tasks that involve construction activities such as cutting/sawing, drilling/coring, jackhammering, and sweeping/housekeeping activities that may create exposure to materials containing silica.
- **Drywall:** Tasks that involve construction activities such as cutting/sawing, drilling/coring, sacking/patching, sanding, and sweeping/housekeeping activities that may create exposure to materials containing silica.

- **Grout:** Tasks that involve construction activities such as mixing/pouring, sacking/patching, and sweeping/housekeeping activities that may create exposure to materials containing silica.
- **Mortar:** Tasks that involve construction activities such as cutting/sawing, grinding, sweeping/housekeeping activities that may create exposure to materials containing silica.
- **Rock:** Tasks that involve construction activities dealing with earthmoving activities that may create exposure to materials containing silica.
- **Sand:** Tasks that involve construction activities dealing with earthmoving activities that may create exposure to materials containing silica.
- **Stone:** Tasks that involve construction activities such as cutting/sawing, grinding, sweeping/housekeeping activities that may create exposure to materials containing silica.
- **Tile:** Tasks that involve construction activities such as cutting/sawing, drilling/coring, grinding, jackhammering, and sweeping/housekeeping activities that may create exposure to materials containing silica.

Hausmann Construction, Inc. employees or sub-contractors who work in proximity to silica-related operations must be aware of safe work practices and take all necessary precautions associated with avoiding and minimizing airborne silica exposure.

4.0 Regulatory Review

Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1153: Respirable Crystalline Silica (Construction Industry) and 29 CFR 1910.1053: Respirable Crystalline Silica (General Industry), contain regulatory requirements specific to respirable crystalline silica. This Written Exposure Control Plan is developed in accordance with the requirements in 29 CFR 1926.1153(g).

5.0 Project Planning

5.1 Training Requirements

Hausmann Construction, Inc. employees who anticipate working on projects where they could be exposed to airborne silica will be provided training in silica hazards in accordance with the crystalline silica exposure program that is established to comply with the hazard communication standard (29 CFR 1910.1200). Each employee will have access to labels on containers of crystalline silica and safety data sheets, and be provided information on the health hazards of silica including cancer, lung effects, immune system effects, and kidney effects. In addition, Hausmann Construction, Inc. employees will be provided training and information regarding specific activities identified in this plan that could result in airborne silica exposure, and the specific engineering controls, work practices and respiratory protection requirements to mitigate the potential airborne silica exposures. This training will provide a discussion of silica hazards, initial exposure determination either by complying with 29 CFR 1926.1153 Table 1 requirements or air monitoring, specific engineering and work practice control measures, personal protective equipment (PPE), and medical surveillance requirements. The training will also identify the Hausmann Construction, Inc. competent person for silica exposure identification and determination of control requirements. All Hausmann Construction, Inc. employees will be provided with access to a copy of 29 CFR 1910.1153 and be trained on the contents of 29 CFR 1926.1153.

5.2 Medical Surveillance Requirements

Hausmann Construction, Inc. shall institute medical surveillance for any employees required by this Plan to wear a respirator 30 or more days per year. Initial medical surveillance consists of medical and work history with emphasis on: past, present, and anticipated exposure to silica, dust and other agents affecting the respiratory system; any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history; a physical examination with emphasis on the respiratory system; chest X-ray (a single postero-anterior radiographic projection or radiograph of the chest at full inspiration recorded on either film (no less than 14 x 17 inches and no more than 16 x 17 inches) or digital radiography systems), interpreted and classified according to the International Labor Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader; a pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH approved spirometry course; testing for latent tuberculosis infection; and any other tests deemed appropriate by the Occupational Medicine Provider. Subcontractors are responsible for implementing a medical surveillance program for their employees.

5.3 Competent Person Requirements

Hausmann Construction, Inc. shall identify a competent person to inspect and oversee all activities with potential airborne silica exposure. Subcontractors working on projects within the scope of this program shall appoint a competent person capable of executing the duties described herein. The competent person must have training in the inspection of work areas and equipment and in the determination of safe working conditions. This person shall have a working knowledge of the 1926.1153 standards, shall be capable of identifying airborne silica hazards, shall determine the need for initial and additional exposure monitoring, shall recommend and implement engineering and work practice controls, shall establish levels of PPE, and shall have the authority to take action to eliminate hazards and correct incidences of noncompliance.

5.4 Planning Activities

Projects where anticipated activities involve concrete cutting, grinding, sandblasting, drilling, coring, or other abrasive operations are treated as potential sources for airborne silica exposure. Additionally, existing structures and materials such as sheetrock, any painted surfaces with low volatile organic compounds, tile, brick, or some insulation products may contain silica. Likewise, new material installation may involve silica-containing mortar, paints, or insulation. Where process knowledge indicates the presence of silica, Hausmann Construction, Inc. will either implement all controls required by 1926.1153 Table 1- Exposure Control Methods for Selected Construction Operations or conduct an initial determination in accordance with 29 CFR 1926.1153(d)(2).

6.0 Project Execution

6.1 Safe Work Practices

The requirements of this section are to be followed by Hausmann Construction, Inc. employees, who may be exposed to airborne concentrations of silica at or above the regulatory limits.

6.1.1 Exposure Assessment

Hausmann Construction, Inc. will either comply with and implement all controls required by 1926.1153 Table 1- Exposure Control Methods for Selected Construction Operations or conduct an initial determination in accordance with 29 CFR 1926.1153(d)(2). Hausmann Construction must detail here the specific activities that they perform with potential for airborne silica exposure and identify all requirements specified in 1926.1153 Table 1 or describe the exposure assessment they will perform to determine airborne silica exposure levels and the required interim control measures that will be used to protect employees until the exposure levels have been established and final control measures can be identified. If not following 1926.1153 Table 1 requirements or performing an activity with potential airborne silica exposure not identified in Table 1 the exposure assessment must contain elements listed below.

- An exposure assessment is required when employees may be exposed to airborne silica at or above the action level in order to determine the extent to which employees are exposed and the appropriate exposure controls required.
- An initial determination of exposure shall be made at the beginning of operations. The determination shall consist of the collection of personal air samples representative of a full shift including at least one sample for each job classification in each work area, either for each shift, or for the shift with the highest exposure level.
- During the initial determination, until such time that actual airborne concentrations are determined, personnel shall be protected by respiratory protection based on task- specific anticipated airborne concentrations of silica as illustrated in Table 2 below:
- During the initial determination, and in addition to the levels of respiratory protection required, personnel shall be provided with protective clothing and equipment, hygiene facilities, and training.
- Whenever a change in equipment, process, controls, or personnel occurs, or a new task has been initiated, an additional exposure assessment is required.
- When an assessment determines that exposure has occurred above the action level but below the PEL, additional monitoring shall be required at least every 6 months. Additional monitoring shall continue until such time that the monitoring results fall below the action level on two separate occasions at least 7 days apart.
- When monitoring yields results above the PEL, then quarterly monitoring is required. In addition, the quarterly monitoring may be suspended when additional monitoring results fall below the action level on two separate occasions at least 7 days apart.
- Where the competent person can clearly demonstrate, in the absence of air monitoring data, that a work activity will not create airborne silica concentrations in excess of the action level, then air monitoring may be unwarranted. Where a negative initial determination is reached without air monitoring, the competent person must develop a written explanation as to why exposures are not expected to exceed the action level.

6.1.2 Communication of Hazards

- Each employee shall be provided training and demonstrate knowledge and understanding of the following:
 - Health hazards associated with exposure to respirable crystalline silica
 - Specific tasks that could result in exposure to respirable crystalline silica
 - Specific measures that are required to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and required use of respiratory protection
 - The contents of the 29 CFR 1926.1153
 - The identity of the competent person
 - Purpose and description of the medical surveillance program
- A written compliance program shall be made available to all affected employees.
- In addition, notification to owners, contractors, and other personnel working in the area shall be made.

6.1.3 Control Methods

- Engineering and work practice controls, including administrative controls, shall be implemented to reduce and maintain employee exposure to silica at or below the PEL, to the extent that such controls are feasible.
- Where all feasible engineering and work practice controls that can be instituted are not sufficient to reduce employee exposure to or below the PEL, such controls shall be used, nonetheless, to reduce employee exposure to the lowest feasible level (and in conjunction with respiratory protection).
- Respiratory protection shall be selected based on guidance in 1926.1153 Table 1 or based on a Certified Industrial Hygienist's or competent person's assessment of the potential airborne exposure that may be created by the means and methods of work (high energy operations with high airborne dust generation or low energy operations with low dust generation).
- When using mechanical ventilation to control exposure, regularly evaluate the system's ability to effectively control exposure.
- If administrative controls are used to limit exposure, establish and implement a job rotation schedule that includes employee identification as well as the duration and exposure levels at each job or work station where each affected employee is located.
- A written compliance program shall be established and implemented prior to the start of operations within the scope of this Written Compliance Plan. The written program shall outline the plans for maintaining employee exposure below the PEL.
- Maintain all surfaces as free as possible from accumulations of silica. Select methods for cleaning surfaces and floors that minimize the likelihood of silica becoming airborne (such as using a HEPA vacuum).



- If vacuuming is the method selected, specialized vacuums with HEPA filtration are required. Methods to use and empty vacuums in a manner that minimizes the reentry of silica into the workplace shall be described and used. Use of household vacuums with HEPA filters are not allowed at any time for the collection of dust or debris that contains silica.
- Never use compressed air to remove silica from any surface unless it is used in conjunction with a ventilation system designed to capture the airborne dust created while using the compressed air.
- Employees shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in any areas where exposure to silica is above the PEL (in other words, regulated areas).
- Do not allow employees to leave the workplace wearing any protective clothing or equipment that is required to be worn during their work shift without HEPA vacuum removal of dust.
- Where feasible, install shower facilities and require employees who work in regulated areas to shower at the end of their work shift. Also provide an adequate supply of cleaning agents and clean towels.
- Provide hand washing facilities for use by employees working in regulated areas. Furthermore, require employees to wash their hands and face at the end of the work shift and prior to eating or entering eating facilities, drinking, smoking, or applying cosmetics.
- Eating facilities or areas shall be provided for employees working in regulated areas. These facilities shall be maintained free of silica contamination and shall be readily accessible to those employees.



6.1.4 Personal Protective Equipment (PPE)



Respiratory protection must be used for the following conditions:



- During periods when employee exposure to airborne silica exceeds the PEL
- For work operations where engineering and work-practice controls are not sufficient to reduce employee exposure to or below the PEL
- During periods when an employee requests a respirator
- During periods when respirators are required to provide interim protection while conducting initial exposure assessments
- Powered air-purifying respirators (PAPR) shall be provided to employees who request such a respirator to use where it will provide adequate protection.
- Employees shall be provided, at no cost, protective work clothing and equipment including cotton coveralls or similar full-body clothing, gloves, hats, shoes or disposable shoe coverlets, face shields, vented goggles, or other appropriate PPE.

6.1.5 OSHA Table 1

Equipment/Task	Engineering and Work Practice Control Methods	Respirator Requirements and Minimum Assigned Protection Factor (APF) for 4 Hours or Less	Respirator Requirements and Minimum Assigned Protection Factor (APF) for More Than 4 Hours
<p>Stationary masonry saws</p> 	<ul style="list-style-type: none"> • 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 required)	(None required)
<p>Handheld power saws (any blade diameter)</p> 	<ul style="list-style-type: none"> • 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: 		
<p>- When used outdoors</p>	(None required)	(APF 10 required)	
<p>- When used indoors or in an enclosed area</p>	(APF 10 required)	(APF 10 required)	

<p>Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)</p> 	<p>For tasks performed outdoors only:</p> <ul style="list-style-type: none"> • 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 airflow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency. 	<p>(None required)</p>	<p>(None required)</p>
<p>Walk-behind saws</p> 	<ul style="list-style-type: none"> • 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: 		
	<p>- When used outdoors</p>	<p>(None required)</p>	<p>(None required)</p>
	<p>- When used indoors or in an enclosed area</p>	<p>(APF 10 required)</p>	<p>(APF 10 required)</p>

<p>Drivable saws</p> 	<p>For tasks performed outdoors only:</p> <ul style="list-style-type: none"> • 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. 	<p>(None required)</p>	<p>(None required)</p>
<p>Rig-mounted core saws or drills</p> 	<ul style="list-style-type: none"> • 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. 	<p>(None required)</p>	<p>(None required)</p>

<p>Handheld and stand-mounted drills (including impact and rotary hammer drills)</p> 	<ul style="list-style-type: none"> • 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 airflow 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. 	<p>(None required)</p>	<p>(None required)</p>
<p>Dowel drilling rigs for concrete</p> 	<p>For tasks performed outdoors only:</p> <ul style="list-style-type: none"> • 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. • Use a HEPA-filtered vacuum when cleaning holes. 	<p>(APF 10 required)</p>	<p>(APF 10 required)</p>

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 required)

(None required)

OR

Operate from within an enclosed cab and use water for dust suppression on drill bit.

(None required)

(None required)

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 required)

(APF 10 required)

- When used indoors or in an enclosed area

(APF 10 required)

(APF 10 required)

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 airflow 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 required)

(APF 10 required)

- When used indoors or in an enclosed area

(APF 10 required)

(APF 10 required)

Handheld grinders for mortar removal (i.e., tuckpointing)



- 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.

(APF 10 required)

(APF 25 required)

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.
- Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.

(None required)

(None required)

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 required)



(None required)



- When used indoors or in an enclosed area

(None required)

(APF 10 required)

<p>Walk-behind milling machines and floor grinders</p> 	<ul style="list-style-type: none"> • Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. 	<p>(None required)</p>	<p>(None required)</p>
<p>OR</p>			
<p>Small drivable milling machines (less than half-lane)</p> 	<ul style="list-style-type: none"> • Use machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions. 	<p>(None required)</p>	<p>(None required)</p>

<p>Large drivable milling machines (half-lane and larger)</p> 	<p>For cuts of any depth on asphalt only:</p> <ul style="list-style-type: none"> • Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions. 	<p>(None required)</p>	<p>(None required)</p>
	<p>For cuts of four inches in depth or less on any substrate:</p> <ul style="list-style-type: none"> • Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions. 	<p>(None required)</p>	<p>(None required)</p>
	<p>OR</p>		
	<ul style="list-style-type: none"> • Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions. 	<p>(None required)</p>	<p>(None required)</p>
<p>Crushing machines</p> 	<ul style="list-style-type: none"> • Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyors, sieves/sizing or vibrating components, and discharge points). • 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. 	<p>(None required)</p>	<p>(None required)</p>

<p>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</p> 	<p>Operate equipment from within an enclosed cab.</p>	<p>(None required)</p>	<p>(None required)</p>
	<p>When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.</p>	<p>(None required)</p>	<p>(None required)</p>
<p>Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials</p> 	<p>Apply water and/or dust suppressants as necessary to minimize dust emissions.</p>	<p>(None required)</p>	<p>(None required)</p>
	<p>OR</p>		
	<p>When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.</p>	<p>(None required)</p>	<p>(None required)</p>