

Respirable Crystalline Silica

Exposure Control Policy, Program & Procedure

Enterprise Masonry Corporation is committed to providing a safe and healthy workplace to our employees, recognizing the right of workers to work in a safe and healthy work environment and ensuring that Enterprise Masonry Corporation's activities do not adversely affect the health and safety of any other persons. This commitment includes ensuring every reasonable precaution is taken to protect our employees (and others) from the adverse health effects associated with exposure to silica.

Last Updated April 28, 2017

1. Silica Overview

1.1. Silica is the second most common mineral on earth, found in the common form as “sand” and “rock”. Silica is the compound formed from the elements silicon (Si) and oxygen (O) and has a molecular form of SiO_2 . The three main forms or ‘polymorphs’ of silica are alpha quartz, cristobalite and tridymite. The polymer most abundant and most hazardous to human health is alpha quartz, and is commonly referred to as crystalline silica.

1.2. Health Hazards Associated with Silica Exposure

1.2.1. The health hazards of silica come from breathing in the dust. If crystalline silica becomes airborne through industrial activities, exposures to fine crystalline silica dust (*specifically exposure to the size fraction that is considered to be respirable*) can lead to a disabling, sometimes fatal disease called silicosis. The fine particles are deposited in the lungs, causing thickening and scarring of the lung tissue. The scar tissue restricts the lungs’ ability to extract oxygen from the air. This damage is permanent, but the symptoms of the diseases may not appear for many years. As noted in the following Figure, (respirable) silica dust is very small, and is not visible to the human eye.

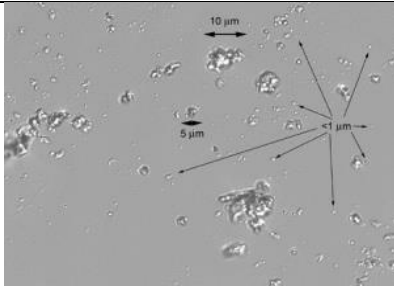


Figure 1: Crystalline silica up close. 1000 times magnification of sand dust. These particles are small enough to be trapped in lung tissue.

1.2.2. A worker may develop any of three types of silicosis, depending on the concentration of silica dust and the duration of the exposure:

- 1.2.2.1. Chronic Silicosis: Develops after 10 or more years of exposure to crystalline silica and relatively low concentrations.
- 1.2.2.2. Accelerated Silicosis: Develops 5 to 10 years after initial exposure to crystalline silica at high concentrations.
- 1.2.2.3. Acute Silicosis: Develops within weeks, or 4 to 5 years, after exposure to very high concentrations of crystalline silica.

1.2.3. Initially, workers with silicosis may have no symptoms; however, as the disease progresses, workers may experience:

- 1.2.3.1. Shortness of Breath
- 1.2.3.2. Severe Cough
- 1.2.3.3. Weakness

1.3. Symptoms can worsen over time and lead to death. Exposure to silica has also been linked to other diseases, including bronchitis, tuberculosis, and lung cancer.

2. Silica Exposures at Enterprise Masonry Corporation

- 2.1. Some of the activities performed on Enterprise Masonry Corporation projects result in the creation/release of silica dust, thus exposing our employees. These activities include, but are not necessarily limited to:
 - 2.1.1. Stationary masonry saws;
 - 2.1.2. Handheld power saws;
 - 2.1.3. Drivable saws;
 - 2.1.4. Handheld and stand-mounted drills (including impact and rotary hammer drills);
 - 2.1.5. Jackhammers and handheld powered chipping tools;
 - 2.1.6. Handheld grinders;
- 2.2. The construction standard, paragraph (a), also provides an exception where employee exposure will remain below $25 \mu\text{g}/\text{m}^3$ as an 8-hour TWA (Time Weighted Average is used to calculate a workers daily exposure to a hazardous substance (such as chemicals, dusts, fumes, mists, gases, or vapors) or agent (such as occupational noise), averaged to an 8-hour workday, taking into account the average levels of the substance or agent and the time spent in the area.) under any foreseeable conditions, but it does not require the employer to have objective data to support the exception. OSHA found that the tasks listed below, **when performed in isolation from activities that do generate significant exposures to respirable crystalline silica (e.g., tasks listed on Table 1, abrasive blasting)**, do not create respirable crystalline silica exposures that exceed $25 \mu\text{g}/\text{m}^3$ as an 8-hour TWA. These examples are not exclusive, and there may be other tasks that involve exposure under $25 \mu\text{g}/\text{m}^3$ as an 8-hour TWA under any foreseeable conditions.
 - 2.2.1. Mixing Mortar
 - 2.2.2. Pouring Concrete Footers, Slab Foundation, and Foundation Walls
 - 2.2.3. Removal of Concrete Formwork

3. Definitions

- 3.1. **Action level** means an airborne concentration of 25 µg/m³ calculated as an 8-hour TWA. Exposures at or above the action level trigger requirements for exposure assessment.
- 3.2. **Competent person** means 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 implement the written exposure control plan required under the standard.
- 3.3. **Employee exposure** means the exposure to airborne respirable crystalline silica that would occur if the employee were not using a respirator.
- 3.4. **High-efficiency particulate air (HEPA) filter** means a filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter. HEPA-filtered vacuuming is an example of a housekeeping method that minimizes employee exposure to respirable crystalline silica, and some Table 1 tasks require HEPA-filtered vacuuming.
- 3.5. **Objective data** means information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.
- 3.6. **Physician or other licensed health care professional [PLHCP]** is an individual whose legally permitted scope of practice (*i.e.*, license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular healthcare services required by this standard.
- 3.7. **Specialist** means an American Board Certified Specialist in Pulmonary Disease or an American Board Certified Specialist in Occupational Medicine.

4. Responsibilities

4.1. Due to the risk posed by respirable silica, it is critical that all personnel involved in activities that could potentially create silica dust take specific actions to ensure that, as much as practicable, a hazard is not created. In recognition of this, the following (Silica related) responsibilities have been established and must be adhered to:

4.1.1. Enterprise Masonry Corporation (I.e. Senior Management) is responsible for:

- 4.1.1.1. Regularly evaluating new equipment and technologies that become available, as able/appropriate, purchasing the “best available” equipment/technologies (*within Enterprise Masonry Corporation’s capabilities*). Equipment/technologies with (silica) dust suppression and/or capture technologies will generally be given preference over equipment/technologies that lack such.
- 4.1.1.2. Ensuring project and/or task specific Exposure Control Plans (ECPs) are developed communicated and effectively implemented as appropriate.
- 4.1.1.3. Ensuring that all employees (*i.e. Managers, Supervisors and Workers*) receive the necessary education and training related to this Policy, as well as project/task specific ECPs.
- 4.1.1.4. Maintaining applicable records (*i.e. inspections, respirator fit tests, training records, etc.*) in accordance with *Enterprise Masonry Corporation’s* record retention procedures/practices.

4.1.2. Enterprise Masonry Corporation Supervisors (i.e. Superintendents/Foreman) are responsible for:

- 4.1.2.1. Obtaining a copy of the project/task specific ECPs (*and/or other similar such information*), and ensuring such are made available at each work site.
- 4.1.2.2. Ensuring that all the tools, equipment, PPE and materials (*including water*) necessary to implement the ECP is available (*and in good working order*) prior to allowing work activities to commence.
- 4.1.2.3. Ensuring that all workers (*under the supervisor’s direction and control*) have received the necessary education and training. As appropriate, each supervisor must ensure that workers are available to “demonstrate competency” for identified tasks.
- 4.1.2.4. Ensuring that workers adhere to the project/task specific ECP, including PPE and personal hygiene (*i.e. including being clean shaven where the respirator seals to the user’s face*) requirements.
- 4.1.2.5. Coordinating work activities with the Owner/Prime Contractor as required, and/or otherwise implementing the controls necessary to protect others (i.e. erecting of barricades and signage) who could be adversely effected by Enterprise Masonry Corporation’s acts (or omissions).

4.1.3. Enterprise Masonry Corporation Employees (and subcontracted employees) are responsible for:

- 4.1.3.1. Knowing the hazards of silica dust exposure.
- 4.1.3.2. Using the assigned protective equipment in an effective and safe manner.
- 4.1.3.3. Working in accordance with the project/task specific ECP.

- 4.1.3.4. Reporting (*immediately*) to their supervisor, any hazards (*i.e. unsafe conditions, unsafe acts, improperly operating equipment, etc.*).

5. Exposure Control Methods

- 5.1. The silica standard for construction provides a flexible approach for construction employers to achieve compliance. The standard includes Table 1, which lists 18 common tasks using various types of tools or equipment found at construction sites. Enterprise Masonry Corporation has elected to follow the Table for employee protection and will fully and properly implement the engineering controls, work practices, and respiratory protection specified in Table 1. As a result of complying with Table 1 Enterprise Masonry Corporation will not be required to conduct exposure assessments or comply with a PEL for those employees.
- 5.2. **Employees engaged in the Table 1 task** means the equipment operator; masons, helpers, laborers and other employees who are assisting with the task; or any other employee responsible for completing the task. For example, an employee operating a walk-behind saw and another employee helping the operator guide the saw are both engaged in the task. An employee operating a jackhammer would be engaged in the task, but another employee directing traffic near the employee jackhammering would not be engaged in the task. When Table 1 requires respiratory protection, Enterprise Masonry Corporation will provide respirators to all employees engaged in the task. Enterprise Masonry Corporation will describe procedures for restricting access of employees not engaged in the task as part of its *Written Exposure Control Plan*.
- 5.3. **Fully and properly implemented** means that controls are in place, are properly operated and maintained, and employees understand how to use them. Several factors required for full and proper implementation of controls are listed in the discussion for each Table 1 entry below. The presence of large amounts of visible dust generally indicates that controls are not fully and properly implemented. A small amount of dust can be expected from equipment that is operating as intended by the manufacturer; however, a noticeable increase in dust generation during the task is a sign that the dust controls are not operating correctly. The difference between the small amounts of dust generated when control measures are working properly and the large amount of dust generated during tasks when control measures are not used or not operated effectively is easily observed. When this happens, prompt corrective actions are required.

As part of full and proper implementation, many Table 1 tasks require the employer to operate and maintain tools according to manufacturers' instructions for minimizing dust emissions. Manufacturer's instructions for minimizing dust can include:

- 5.3.1. Water flow rates,
- 5.3.2. Vacuum equipment air flow rate and capacity,
- 5.3.3. Rotation of the blade (speed, direction),
- 5.3.4. Maintaining and changing blades,
- 5.3.5. Frequency for changing water

- 5.4. Several entries in Table 1 have requirements for the use of **respiratory protection with a minimum “assigned protection factor” (APF)**. Paragraph (d)(3)(i)(A) of the Respiratory Protection standard (29 CFR 1910.134) includes a table that can be used to determine the type or class of respirator that will provide employees with a particular APF, and it can help determine the type of respirator that would meet the required minimum APF specified by Table 1. Enterprise Masonry Corporation at its discretion may provide a more protective respirator to those employees who request one or require the employees to use a more protective respirator.

5.5. Description of Table 1 Entries

This section lists each Table 1 entry applicable to Enterprise Masonry Corporation operations and explains the requirement for that entry.

5.5.1.

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



Stationary masonry saws will be equipped with an integrated water delivery system (commercially developed specifically for the type of tool in use) that continuously feeds water to the blade. The water delivery system usually includes a nozzle for spraying water attached near the blade that is connected to a water basin by a hose and pump. The tool will be operated and maintained in accordance with manufacturer’s instructions to minimize dust emissions. Stationary masonry saws equipped with an integrated system for blade cooling also suppress dust and meet the requirements of Table 1.

Enterprise Masonry Corporation will make certain full and proper implementation of water controls on stationary masonry saws by ensuring:

- An adequate supply of water for dust suppression is used;
- The spray nozzle is working properly to apply water at the point of dust generation;
- The spray nozzle is not clogged or damaged; and
- All hoses and connections are intact.

Table 1 does not specify a minimum flow rate; however, water must be applied at the flow rates specified by the manufacturer.

When using a stationary masonry saw indoors or in an enclosed space (areas where airborne dust can buildup, such as a structure with a roof and three walls), Enterprise Masonry Corporation will provide additional exhaust as needed to minimize the accumulation of visible airborne dust.

Respiratory protection is not required for work with stationary masonry saws regardless of task duration.

5.5.2.

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
(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. • When used indoors or in an enclosed area.	None APF 10	APF 10 APF 10



Handheld power saws with any blade diameter will be equipped with an integrated water delivery system (commercially developed specifically for the type of tool in use) that continuously feeds water to the blade. The water delivery system usually includes a nozzle for spraying water attached near the blade that is connected to a water basin via a hose and pump. The tool will be operated and maintained in accordance with manufacturer's

instructions to minimize dust emissions. Handheld power saws equipped with an integrated water delivery system for blade cooling also suppress dusts and meet the requirements of Table 1.

Enterprise Masonry Corporation will make certain full and proper implementation of water controls on handheld power saws by ensuring:

- An adequate supply of water for dust suppression is used;
- The spray nozzle is working properly to apply water at the point of dust generation;
- The spray nozzle is not clogged or damaged;
- All hoses and connections are intact.

Table 1 does not specify a minimum flow rate; however, water must be applied at the flow rate specified by the manufacturer.

When working with handheld power saws of any blade diameter, respiratory protection with a minimum APF of 10 is required for work done outdoors for more than four hours per shift and for work done indoors, or in an enclosed location, regardless of task duration.

When using a handheld saw indoors or in enclosed spaces (areas where airborne dust can buildup, such as a structure with a roof and three walls), Enterprise Masonry Corporation provide additional exhaust, as needed to minimize the accumulation of visible airborne dust.

5.5.3.

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
(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



Specialty handheld power saws for cutting fiber-cement board (with a blade diameter of 8 inches or less) will be equipped with commercially available dust collection systems and a filter with a 99 percent or greater efficiency. The saws will be operated and maintained in accordance with the manufacturer's instructions to minimize dust emissions, and provide the air flow rate recommended by the manufacturer or greater. Enterprise Masonry Corporation is complying with Table 1; therefore saws must only be used outdoors.

Enterprise Masonry Corporation will make certain full and proper implementation of dust collection systems on handheld power saws for cutting fiber-cement board by ensuring:

- The shroud or cowl is intact and installed in accordance with the manufacturer's instructions;
- The hose connecting the tool to the vacuum is intact and without kinks or tight bends;
- The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions to prevent clogging; and
- The dust collection bags are emptied to avoid overfilling.

Respiratory protection is not required for work outdoors with specialty handheld power saws while cutting fiber-cement board regardless of task duration.

5.5.4.

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
(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



Handheld and stand-mounted drills (including impact and rotary hammer drills)

Handheld and stand-mounted drills will be equipped with a commercially available shroud or cowling with a dust collection system that provides at least the minimum air flow recommended by the manufacturer. The dust collection system must include a filter cleaning mechanism and be equipped with a filter with 99 percent or greater efficiency. In addition, the tool will be operated and maintained in accordance with manufacturer's instructions to minimize dust emissions.

Enterprise Masonry Corporation will make certain full and proper implementation of dust collection systems on handheld drills by ensuring:

- The shroud or cowling is intact and installed in accordance with the manufacturer's instructions;
- The hose connecting the tool to the vacuum is intact and without kinks or tight bends;
- The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; a
- The dust collection bags are emptied to avoid overfilling.

A HEPA-filtered vacuum will be used when cleaning holes. Compressed air can be used to clean holes when used in conjunction with a HEPA-filtered vacuum to capture the dust or a hole cleaning kit designed for use with compressed air.

When using handheld and stand-mounted drills indoors or in enclosed areas (areas where airborne dust can buildup, such as a structure with a roof and three walls), Enterprise Masonry Corporation will provide additional exhaust, as needed to minimize the accumulation of visible airborne dust.

Respiratory protection is not required when using handheld or stand-mounted drills equipped with a dust collection system, including for overhead drilling, regardless of task duration.

5.5.5.

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
(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. - When used indoors or in an enclosed area. 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.	None APF 10	APF 10 APF 10
	- When used outdoors. - When used indoors or in an enclosed area.	None APF 10	APF 10 APF 10



Jackhammers and handheld powered chipping tools will be operated using either a water delivery system that supplies a continuous stream or spray of water at the point of impact, or a tool equipped with a commercially available shroud and vacuum dust collection system. Jackhammers and other handheld powered chipping tools will be operated and maintained in accordance with manufacturer's instructions to minimize dust emissions.

If using the shroud and dust collection system, the vacuum dust collection system must provide at least the air flow recommended by the tool manufacturer, and have a filter with 99 percent or greater efficiency and a filter cleaning mechanism.

The water delivery system is not required to be integrated or mounted on the tool; it can be assembled and installed by Enterprise Masonry Corporation. However, it must deliver a continuous stream or spray of water at the point of impact.

Enterprise Masonry Corporation will make certain full and proper implementation of water controls on jackhammers and other handheld powered chipping tools by ensuring:

- An adequate supply of water for dust suppression is used;
- The water sprays are working properly and produce a pattern that applies water at the point of dust generation;
- The spray nozzles are not clogged or damaged; and
- All hoses and connections are intact.

Acceptable water delivery systems include direct connections to fixed water lines or portable water tank systems. These water delivery systems can be operated by one employee or could require a second employee to supply the water at the point of impact.

Enterprise Masonry Corporation will make certain full and proper implementation of dust collection systems by ensuring:

- The shroud is intact and installed in accordance with the manufacturer's instructions;
- The hose connecting the tool to the vacuum is intact and without kinks or tight bends;
- The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; and
- The dust collection bags are emptied to avoid overfilling.

Respiratory protection with an APF of 10 is required when the task is done outdoors for more than four hours per shift, or when the task is done indoors or in an enclosed location regardless of task duration.

When working indoors or in an enclosed space (areas where airborne dust can buildup, such as a structure with a roof and three walls), Enterprise Masonry Corporation provide additional exhaust, as needed to minimize the accumulation of visible airborne dust.

5.5.6.

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
(xi) 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	APF 25



Handheld grinders for mortar removal (i.e., tuckpointing) Tuckpointing involves removing deteriorating mortar from between bricks using a handheld grinder and replacing it with fresh mortar.

The handheld grinders will be equipped with a commercially available shroud and dust collection system and operated and maintained in accordance with manufacturer's instructions to minimize dust emissions. The dust collection system must provide at least 25 cfm of air flow per inch of wheel diameter and have a filter that has a 99 percent or greater efficiency and either a cyclonic pre-separator or a filter-cleaning mechanism. Cyclonic pre-separators and filter-cleaning mechanisms improve the suction of dust collection systems by preventing debris from building up on the filter.

Enterprise Masonry Corporation will make certain full and proper implementation of dust collection systems by ensuring:

- The shroud is intact, encloses most of the grinding blade, and is installed in accordance with the manufacturer's instructions;
- The hose connecting the tool to the vacuum is intact and without kinks or tight bends;
- The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions;
- The dust collection bags are emptied to avoid overfilling;
- The blade is kept flush against the surface whenever possible; and
- The tool is operated against the direction of blade rotation, whenever practical.

When using handheld grinders for mortar removal indoors or in enclosed areas (areas where airborne dust can buildup, such as a structure with a roof and three walls), Enterprise Masonry Corporation will provide additional exhaust if needed to minimize the accumulation of visible airborne dust.

Respiratory protection with a minimum APF of 10 is required for work with handheld grinders for mortar removal lasting four hours or less in a shift. Respiratory protection with a minimum APF of 25 is required for work lasting more than four hours per shift.

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
(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. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
	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. ▪ When used indoors or in an enclosed area.	None None	None APF 10



Handheld grinders may also be used for tasks other than mortar removal, such as to remove thin layers of concrete and surface coatings. Two control options may be used: (1) A grinder equipped with an integrated water delivery system (commercially developed specifically for the type of tool in use) that continuously feeds water to the grinding surface operated for outdoor work only; and (2) a dust collector equipped with a commercially available shroud and dust collection system with the same features as the dust collection system used for mortar removal for outdoor and indoor work. The dust collector must be rated to provide 25 cfm or greater air flow per inch of wheel diameter, have a filter with a 99 percent or greater efficiency, and a cyclonic pre-separator or filter-cleaning mechanism. Cyclonic pre-separators and filter-cleaning mechanisms improve the suction of dust collection systems by preventing debris from building up on the filter. The grinder and whichever control is chosen will be operated and maintained in accordance with manufacturer's instructions to minimize dust emissions.

The integrated water delivery system can be a free-flowing water system designed for blade cooling as well as manufacturers' systems designed for dust suppression alone. This option applies only when grinders are used outdoors.

Enterprise Masonry Corporation will make certain full and proper implementation of water controls on grinders by ensuring:

- An adequate supply of water for dust suppression is used;
- The spray nozzles are working properly and produce a pattern that applies water at the point of dust generation;
- The spray nozzles are not clogged or damaged; and
- All hoses and connections are intact.

Handheld grinders equipped with dust collection systems may be used outdoors or indoors. Enterprise Masonry Corporation will make certain full and proper implementation of dust collection systems on handheld grinders by ensuring:

- The shroud is intact and installed in accordance with the manufacturer's instructions;
- The hose connecting the tool to the vacuum is intact and without kinks or tight bends;
- The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; and
- The dust collection bags are emptied to avoid overfilling.

Respiratory protection is not required when water-based dust suppression systems are used regardless of task duration. When dust collection systems are used, respiratory protection with a minimum APF of 10 is required only when engaged in a task indoors or in an enclosed location for more than four hours per shift.

When using handheld grinders indoors or in enclosed areas (areas where airborne dust can buildup, such as a structure with a roof and three walls), Enterprise Masonry Corporation will provide additional exhaust as needed to minimize the accumulation of visible airborne dust.

5.5.8. Water Delivery Systems

Integrated water delivery systems are required for several types of equipment in Table 1. Integrated water systems must be developed specifically for the type of tool in use so they will apply water at the appropriate dust emission points based on tool configuration and do not interfere with other tool components or safety devices. Water systems designed for blade cooling also suppress dust and meet the requirements for Table 1.

The water must be applied at flow rates sufficient to minimize release of visible dust. Effective control of the dust depends on factors such as dust particle size, dust particle velocity, spray nozzle size and location, use of surfactants or other binders, and environmental factors (water hardness, humidity, weather, etc.), all of which must be considered when using wet methods. The appropriate water flow rates for controlling silica dust emissions can vary; therefore, it is necessary to follow manufacturers' instructions when determining the required flow rate for dust suppression systems on a given worksite.

Any slurry generated when using water to suppress dust should be cleaned up to limit secondary exposure to silica dust when the slurry dries.

When working in cold temperatures, where there is a risk of water freezing, additional work practices such as insulating drums, wrapping drums with gutter heat tape or adding environmentally-friendly antifreeze additives to water may be needed.

5.5.9. Dust Collections Systems

Commercially available dust collection systems (*i.e.*, LEV) are required for several types of equipment in Table 1. Enterprise Masonry Corporation will only use commercially available dust collection systems that are designed to effectively capture dust generated by the tool being used and will not introduce new hazards such as obstructing or interfering with safety mechanisms.

The "commercially available" limitation is meant only to eliminate on-site improvisations of equipment. Products that are made by aftermarket manufacturers (someone other than the original tool manufacturer) that are intended to fit the make and model of the tool may be utilized. This includes custom-designed products made to meet the particular needs and specifications of Enterprise Masonry Corporation. These systems are designed to work effectively with the equipment and not introduce new hazards such as obstructing or interfering with safety mechanisms. If Enterprise Masonry Corporation elects to use methods other than commercially available systems for dust suppression, the company will conduct exposure assessments and comply with the PEL (Permissible Exposure Limit is a legal limit in the United States for exposure of an employee to a chemical substance or physical agent such as loud noise. Permissible exposure limits are established by the Occupational Safety and Health Administration (OSHA)).

Some Table 1 entries for dust collection systems specify use of cyclonic pre-separators and filter cleaning mechanisms to prevent buildup of debris on filters that result in less dust capture. A cyclonic pre-separator collects large debris before the air reaches the filters. A filter cleaning mechanism prevents the need for manually cleaning filters to prevent buildup of debris (caking). Some vacuums are equipped with a gauge indicating filter pressure or an equivalent device (*e.g.*, timer to periodically pulse the filter) to help employees in determining when it is time to run a filter cleaning cycle.

5.5.10. Indoors or Enclosed Areas

Several Table 1 entries refer to tasks performed “outdoors” or “indoors or in an enclosed area.” Indoors or in an enclosed areas mean areas where airborne dust can build up unless additional exhaust is used. For example, a work area with only a roof that does not affect the dispersal of dust would not be considered enclosed; however, an open-top structure with three walls and limited air movement or a roof that does limit dispersal would be considered enclosed.

Sufficient air circulation in enclosed or indoor environments is important to ensure the effectiveness of the control strategies and to prevent the accumulation of airborne dust. Enterprise Masonry Corporation has elected to follow Table 1 and will therefore provide a means of exhaust as needed to minimize the accumulation of visible airborne dust for tasks performed indoors or in enclosed areas. The means of exhaust necessary could include: the use of portable fans (box fans, floor fans, axial fans), portable ventilation systems, or other systems that increase air movement and assist in the removal and dispersion of airborne dust. To be effective, the ventilation must be set up so that movements of employees during work, or the opening of doors and windows, will not negatively affect the airflow.

5.5.11. Determining Task Duration and Requirements for Respirator Use

Respirator requirements in Table 1 are divided by task duration:

- “Less than or equal to four hours/shift” and,
- “Greater than four hours/shift”.

Each of the following scenarios is considered a “shift” for purposes of determining the maximum amount of time that an employee may spend on Table 1 tasks without respiratory protection:

- A standard 8-hour work period;
- A day with a break between work periods (*e.g.*, four hours on, two hours off, four hours on);
- Work periods longer than eight hours;
- Double shifts within a single day;
- A work period spanning two calendar days (*e.g.*, 8 p.m. until 4 a.m.).

Task duration time starts when the employee begins using the tool, and continues to be counted until he or she completes the task. This time includes intermittent breaks in tool usage and clean-up. However, tasks that are performed multiple times per day, during distinct time periods, should be counted as separate tasks, and times should be combined.

The requirement to provide respirators is based on the anticipated duration of the task. Enterprise Masonry Corporation will make a good-faith judgment of the task’s anticipated duration over the work shift, whether performed continuously or intermittently, based on previous experience and all other available information.

Examples of Determining Task Durations:

- Tasks with intermittent breaks. An employee cuts and places bricks, one at a time, for four hours consecutively and then spends 30 minutes cleaning up the saw and emptying slurry or

dust collectors. All four hours spent cutting and laying bricks along with the 30 minutes for clean-up count for total task duration of four and a half hours.

- Tasks with distinct time periods. An employee cuts multiple bricks for 15 minutes, lays bricks for two hours before returning to cut more bricks for another 30 minutes. The total task duration is 45 minutes.

If Enterprise Masonry Corporation estimates that an employee will perform a single task for four hours or less during a single shift, then the company will ensure that the employee uses whichever respirator, if any, is specified in the “ ≤ 4 hr/shift” column in Table 1. If Enterprise Masonry Corporation estimates that the task will take more than four hours, then the company will ensure that the employee uses any respiratory protection specified in the “ > 4 hr/ shift” column in Table 1, during the entire task, not just during the time beyond the first four hours that the task is performed. If Enterprise Masonry Corporation anticipates that a task will take four hours or less, but unforeseen difficulties will extend the task duration beyond four hours, the company will provide the listed respiratory protection as soon as it becomes evident that the duration of the task may exceed the 4-hour limit, measured from the beginning of the task.

Where an employee performs more than one task in Table 1 during the course of a shift, and the total duration of all tasks combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified in the less than four hours per shift column. If the total duration of all Table 1 tasks combined is more than four hours per shift, the required respiratory protection for each task is the respiratory protection specified in the more than four hours per shift column. As was discussed for single tasks, if multiple tasks are estimated to last less than 4 hours, but it becomes evident that the tasks will take more than four hours total, Enterprise Masonry Corporation will reexamine respiratory protection requirements and immediately provide a respirator, when required.

Examples of Respiratory Protection Requirements for Single Tasks in Table 1

- A company anticipates that it will take an employee 3 hours to cut concrete walls using a handheld power saw (outdoors). No respiratory protection is required.
- A company anticipates that it will take an employee 5 hours to demolish an asphalt road using a jackhammer (outdoors). The company must provide a respirator with an APF of 10 and ensure that the employee wears it for the entire duration of the task.
- A company anticipates that it will take an employee 3 hours to grind a concrete floor (indoors) and, therefore, determines that respiratory protection is not required under Table 1. However, at two hours, the company determines that it will take more than 4 hours to complete the task. The company must provide a respirator with an APF of 10 at that time and ensure that the employee wears it for the remaining duration of the task.

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

- A company 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 company 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.

- A company 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 company 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.
- 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.

6. Respiratory Protection

- 6.1. Enterprise Masonry Corporation will provide employees with appropriate respirators where required by the silica standard. The respirators will comply with requirements of the silica standard and with OSHA's Respiratory Protection standard (29 CFR 1910.134).
- 6.2. Enterprise Masonry Corporation has elected to follow the specified exposure control methods listed in Table 1 and will provide respiratory protection where required by Table 1.
- 6.3. Where respirator use is required, Enterprise Masonry Corporation has implemented a respiratory protection program in accordance with the respiratory protection standard. The respiratory protection program ensures that respirators are properly used in the workplace and are effective in protecting employees.
- 6.4. Enterprise Masonry Corporation may provide respirators at the request of employees or let employees use their own respirators when respirators are not required under the silica standard at its discretion.

7. Housekeeping

- 7.1. The respirable crystalline silica standard requires all construction employers covered by the standard, including those who fully and properly implement the control methods specified in Table 1, to avoid certain housekeeping practices.
- 7.2. Cleaning methods such as dry sweeping, dry brushing, and use of compressed air can cause respirable crystalline silica dust to get into the air and be inhaled by employees. When cleaning up dust that could contribute to employee exposure to respirable crystalline silica, Enterprise Masonry Corporation will not permit:
 - 7.2.1. Dry brushing or dry sweeping, unless methods such as wet sweeping and HEPA-filtered vacuuming are not feasible;
 - 7.2.2. Cleaning of 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.
- 7.3. Feasibility of Cleaning Methods
 - 7.3.1. In a very limited number of cases, cleaning methods such as wet sweeping or HEPA-filtered vacuums may not be safe or effective. When wet methods or HEPA-filtered vacuuming would not be effective, would cause damage, or would create a hazard in the workplace, Enterprise Masonry Corporation will not require these cleaning methods after consultation with and approval from the Project Manager. However, even in cases where one of those cleaning methods may not be safe or effective, another acceptable method for cleaning could be used. For example, if it is not feasible to wet sweep a wood floor because water would damage the wood or cause mold growth, a HEPA-filtered vacuum could be used for cleaning. Therefore, situations in which no acceptable cleaning methods can be used are expected to be very rare. In those rare cases where an employee needs to use cleaning methods such as dry sweeping, dry brushing, or compressed air, Enterprise Masonry Corporation will establish in writing why cleaning methods that decrease employee exposures are not feasible.

8. Written Site Specific Exposure Control Plan

- 8.1. Written exposure control plans are derived from the information contained in this program and describe specific job site exposures and ways to reduce those exposures, such as engineering controls, work practices, housekeeping methods, and restricting access to areas where high exposures occur. The plans improve employee protections by making sure that Enterprise Masonry Corporation identifies all exposures and controls to prevent overexposures. Such plans are also useful for letting employees know what kind of protections they should expect to see on the job.
- 8.2. The plan will include a description of job site tasks involving exposures to respirable crystalline silica. The plan will list all tasks employees will be performing that could expose them to respirable crystalline silica dust. This section could also describe the equipment used and factors that affect exposures, such as types of silica-containing materials handled in those tasks (concrete or brick), weather conditions (wind or humidity), and if tasks are done outdoors versus indoors or in enclosed locations.
 - *Example: Cutting bricks using a stationary masonry saw outdoors.*
- 8.3. The plan will include a description of engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task. For each task that employees perform, the plan will describe types of controls used, like a dust collector with manufacturer's recommended air flow and a filter with 99 percent efficiency, effective work practices, as in checking that water nozzles are not plugged, and if required, appropriate respiratory protection, like a respirator with an APF of 10. The plan could also describe signs that controls are not working effectively, such as an increase in visible dust or no water being delivered to the saw blade.

This section of the written site specific exposure control plan is especially important for Enterprise Masonry Corporation since the company has elected to use controls in Table 1, because they are not required to measure exposures to make sure that controls are working. Therefore, including information such as manufacturer's instructions for operating and maintaining tools to decrease dust, when possible, demonstrates that the company has a complete understanding of those instructions and is using them to control dust. Describing those instructions in the site specific written exposure control plans also lets employees know what the company needs to do to protect them.

- **Example:** *When cutting bricks using a stationary masonry saw, Table 1 will be fully and properly implemented, including using a saw with an integrated water delivery system that delivers a steady stream of water to the cutting blade. The saw operator will make sure that enough water for the saw is available before starting to cut, and that a steady stream of water can be seen while cutting. The operator will change water, when needed, to maintain flow of water to the blade.*

Use the stationary masonry saw in accordance with manufacturer's instructions to minimize the release of visible dust. Inspect dust controls daily to make sure they are functioning properly. Stop work and adjust controls if you see an increase in visible dust.

Respiratory protection is not required.

- 8.4. The plan will include a description of the housekeeping methods used to limit employee exposure to respirable crystalline silica. While employees are cleaning, dust can become airborne and expose them to silica. In this part of the written exposure control plan, Enterprise Masonry Corporation will list acceptable cleaning methods that will be used to prevent employees from being exposed and any protections that are needed if certain cleaning methods have to be used.

This section of the written plan will include cleaning methods that are acceptable (wet sweeping), cleaning methods that are unacceptable because acceptable cleaning methods are feasible (dry sweeping), and special instructions (use local exhaust ventilation if compressed air must be used). Hygiene-related subjects, such as not using compressed air to clean clothing, could also be addressed in this section of the written exposure control plan.

- **Example:** *Slurry generated by the saw will be cleaned up before it dries using a wet vacuum. When emptying the vacuum, the slurry will be transferred into a plastic bag and placed inside a container for disposal. The container will be sealed to prevent the release of dust back into the work space.*

Never sweep or use compressed air on dried slurry. If slurry dries, immediately wet it down and clean it up with the wet vacuum.

- 8.5. The plan will include a description of the procedures used to restrict access to work areas, when necessary, to limit the number of employees exposed to respirable crystalline silica and the levels to which they are exposed, including exposures generated by other employers or self-employed workers. This section of the plan will describe how the company restricts access to prevent exposures, such as:

- Scheduling certain tasks when others are not around,
- Telling employees to stay out of areas where dust is generated,
- Moving employees to an area where they are not exposed to dust, or
- Posting warning signs.

Enterprise Masonry Corporation is following Table 1 and will restrict access when employees are engaged in tasks that require respirator use under Table 1. For example, an employee who is jackhammering for more than four hours and is therefore wearing a respirator, the competent person must make sure that an employee directing traffic (not engaged in the task), is positioned away and upwind from the employee who is jackhammering.

The competent person will also restrict access, when needed, for exposures generated by another employer or self-employed person. Such a situation might occur if the other employer of self-employed person is conducting a task that generates clearly visible dust.

- **Example:** *When the controls on a stationary masonry saw are fully and properly implemented, access does not need to be restricted to decrease other employees' exposure to respirable crystalline silica.*

The competent person can use traffic cones or barrier tape to restrict access if needed for other reasons such as safety concerns.

- 8.6. Enterprise Masonry Corporation will review and evaluate the effectiveness of this program and the job site specific written exposure control plans at least once a year and update them as necessary. A yearly review is needed to make sure that all information in the plan is up-to-date.

8.7. Availability of the Written Exposure Control Plan

Enterprise Masonry Corporation will allow this program and job site specific written exposure control plans to be viewed or copied by each employee covered by the standard, their designated representative, and representatives from OSHA or NIOSH, upon request. Making this program and job site specific exposure control plans available to employees and their designated representatives empowers and protects employees by letting them and their representatives know the silica hazards Enterprise Masonry Corporation identified and controls for those hazards. Making this program and job site specific exposure control plans readily available to OSHA or NIOSH allows them to verify that employee protections are effective. If OSHA inspects a workplace, the OSHA Compliance Safety and Health Officer will ask to see the written exposure control plan.

8.8. Sample Written Exposure Control Plan

To help develop written site specific exposure control plans, a sample plan is included on the next page. This sample shows an easy-to-use format that can be changed to address the specific tasks performed at each job site. The sample plan meets the requirements of the standard and contains the level of detail that OSHA considers useful to help protect employees. As the sample shows, the plan can contain useful information without being long or complicated.

Sample Written Exposure Control Plan

Company:

John Doe Renovators

Person Completing the Plan, Title:

John Doe, Owner

Description of Task: Demolishing concrete and tile floors inside homes or public buildings using a jackhammer.

Control Description**Controls:**

- Use jackhammer equipped with the appropriate, commercially available shroud and a vacuum dust collection system with the flow rate recommended by the jackhammer manufacturer, a filter that is at least 99 percent efficient, and a filter cleaning mechanism.
- Use a portable fan to exhaust air and prevent the buildup of dust.

Work practices:

- Check shrouds and hoses to make sure they are not damaged before starting work.
- Make sure the hoses do not become kinked or bent while working.
- Use switch on vacuum to activate filter cleaning at the frequency recommended by the manufacturer.
- Replace vacuum bags as needed to prevent overfilling.
- Use the jackhammer and vacuum controls according to manufacturer's instructions for reducing the release of visible dust.
- If visible dust increases, check controls and adjust as needed.

Respiratory protection:

- Use respirator with APF of 10 the entire time the task is being performed.
- See the written respiratory protection program for information on selection, training and fit testing requirements, in addition to proper use instructions for respirators (for example, being clean shaven when using a respirator that seals against the face).

Housekeeping:

- Dust containing silica on work surfaces and equipment must be cleaned up using wet methods or a HEPA-filtered vacuum.
- Do not use compressed air or dry sweeping for removing dust and debris containing silica from work surfaces.
- Dispose of used vacuum bags in a container and keep the container sealed.

Procedures Used to Restrict Access to Work Areas:

Schedule the work so that only employees who are engaged in the task (the jackhammer operator and employees helping the operator) are in the area.

8.9. Competent Person Requirements

The employer must designate a competent person to frequently and regularly inspect job sites, materials, and equipment to implement the written exposure control plan. A competent person is someone who:

- Can identify existing and foreseeable respirable crystalline silica hazards;
- Is authorized to promptly eliminate or minimize silica hazards; and
- Has the knowledge and ability to implement the written exposure control plan.

Any employee can be designated as a competent person if the employee is qualified, including the employee who does the work on a jobsite. For example, an employee who goes to a jobsite alone can be designated a competent person if the person knows how to properly implement controls on the tools they use, can recognize if the controls are not working, and can correct the non-working control.

The standard does not require specific training for a competent person. Enterprise Masonry Corporation is responsible for determining what training is necessary to provide the knowledge and ability for its competent person to implement the written exposure control plan.

The training will depend on the type of work done, and in some cases, successfully completing training required under the silica standard and OSHA's Hazard Communication standard will be enough. In other cases, additional training may be needed.

9. Medical Surveillance

- 9.1. Medical surveillance is intended to identify respirable crystalline silica-related diseases so that employees with those diseases can take actions to protect their health; to determine if an employee has any condition, such as a lung disease, that might make him or her more sensitive to respirable crystalline silica exposure; and to determine the employee's fitness to use respirators.
- 9.2. Enterprise Masonry Corporation will ensure all medical examinations and procedures required by the standard will be performed by a PLHCP. Medical surveillance will be provided at no cost to employees, and at a reasonable time and place. If getting the medical examination requires the employee to travel away from the worksite, Enterprise Masonry Corporation will cover the cost of travel. The company will also pay employees for time spent traveling and taking medical examinations.
- 9.3. Which Employees Must be Offered Medical Surveillance
 - 9.3.1. Enterprise Masonry Corporation will make an initial or periodic medical examination available to employees who will be required by the silica standard to wear a respirator for 30 or more days per year in the upcoming year (the next 365 days). If the employee is required to wear a respirator at any time during a day, that counts as one day of respirator use.
 - 9.3.2. Enterprise Masonry Corporation will estimate based on past experience how often respirator use will be required by the standard in the upcoming year based on the types of tasks that the employee will perform, as well as how long and how often those tasks are performed. Respirator use with past employers does not count toward the 30-day threshold.
 - 9.3.3. When unexpected circumstances result in employees being required to wear respirators more frequently than first expected, Enterprise Masonry Corporation will 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 upcoming year.
- 9.4. Frequency of Medical Examinations
 - 9.4.1. Enterprise Masonry Corporation will offer medical examinations:
 - 9.4.1.1. Within 30 days of initial assignment (the day the employee starts working in a job/ task in which he or she will be required by the silica standard to wear a respirator for 30 or more days per year), unless the employee has had an examination that meets the requirements of the silica standard within the last three years.
 - 9.4.1.2. Every three years from the employee's last examination that met the requirements of the silica standard, or more frequently if recommended by the PLHCP, if the employee will continue to perform tasks that require respirator use under the silica standard for 30 or more days per year.

- 9.4.1.2.1. A PLHCP might recommend more frequent medical examinations based on factors such as high exposure levels or a medical finding such as an X-ray suggesting silicosis.

9.4.2. Enterprise Masonry Corporation will ensure that employees receive a dated copy of the PLHCP's written medical opinion for the company, and the employee can present that opinion to a new employer as proof of a current medical examination. Enterprise Masonry Corporation can determine when they must offer an employee the next periodic medical examination based on the examination date on the written medical opinion.

9.4.3. Employees who are required to wear respirators will receive medical evaluations required by the respiratory protection standard before they are fit tested for a respirator or wear a respirator in the workplace. The medical evaluation for the respiratory protection standard can be combined with the medical examination for silica, and Enterprise Masonry Corporation may choose at its discretion to have the PLHCP conduct both the evaluation for respirator use and examination for silica at the same time. The company may also have employees evaluated for respirator use before they wear a respirator and then offer the silica examination later, according to the required time limits of the silica standard.

9.5. Which Tests are Included in the Examination

9.5.1. An initial medical examination provided under the silica standard consists of:

- 9.5.1.1. A medical and work history that focuses on: past, present, and anticipated exposure to respirable crystalline silica, dust, and other agents affecting the respiratory system; any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (for example, shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history;
 - 9.5.1.2. A physical examination that focuses on the respiratory system;
 - 9.5.1.3. A digital or film chest X-ray interpreted according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconioses by a National Institute for Occupational Safety and Health (NIOSH)-certified B Reader (this involves a certified physician reading the X-ray according to certain procedures to determine if it shows signs of diseases such as silicosis);
 - 9.5.1.4. A lung function (spirometry) test that includes forced vital capacity (the total amount of air that is forcefully blown out after taking a full breath), forced expiratory volume in one second (the amount of air forcefully blown out in the first second), and FEV1/FVC ratio (the speed of air that is forcefully blown out), administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course;
 - 9.5.1.5. Testing for latent tuberculosis infection;
 - 9.5.1.6. Any other tests deemed appropriate (medically necessary and related to respirable crystalline silica exposure) by the PLHCP.
- 9.5.2. Periodic examinations include all these tests, with the exception of testing for latent tuberculosis, which is only required for the initial examination.

9.5.3. Employees who must be offered medical surveillance are at risk of developing respirable crystalline silica-related diseases, and the required tests are the minimum tests needed to look for those diseases. More tests may also be needed to address an employee's medical complaint or a finding related to respirable crystalline silica exposure, such as abnormal lung function. The standard gives the PLHCP the flexibility to order additional tests he or she deems appropriate. Enterprise Masonry Corporation will make those tests ordered by the PLHCP available to the employee.

9.5.4. Information Enterprise Masonry Corporation will provide to the PLHCP

9.5.4.1. Enterprise Masonry Corporation will ensure that the examining PLHCP has a copy of the standard and must provide the PLHCP with:

- 9.5.4.1.1. A description of the employee's past, current, and future duties as they relate to respirable crystalline silica exposure;
- 9.5.4.1.2. The employee's past, current, and future levels of exposure to respirable crystalline silica. Enterprise Masonry Corporation is following Table 1 and is not required to measure exposures, therefore, the company will indicate if the employee is likely exposed at or above the PEL, based on required respirator use under Table 1;
- 9.5.4.1.3. A description of any personal protective equipment used, or to be used, by the employee, including when and for how long the employee has used or will use that equipment; and
- 9.5.4.1.4. Information from records of employment-related medical examinations previously provided to the employee and currently within the control of Enterprise Masonry Corporation.

9.5.4.2. The PLHCP needs this information to evaluate the employee's health in relation to assigned duties and fitness to use personal protective equipment, such as respirators. The information provided to the PLHCP includes only that within the control of Enterprise Masonry Corporation; the company is not required to obtain information from past employers.

9.6. The PLHCP's Written Medical Report for the Employee

9.6.1. Enterprise Masonry Corporation will ensure that the PLHCP explains the results of the medical examination to the employee and gives the employee a written medical report within 30 days of each medical examination performed. Only the employee receives the written medical report, and Enterprise Masonry Corporation will not receive a copy of this report. The report must contain:

- 9.6.1.1. A description of the medical examination results, including any medical condition(s) that would place the employee at increased risk of material impairment of health from exposure to respirable crystalline silica (any health condition that might make the employee more sensitive to exposure). The report must also describe any medical conditions that require further evaluation or treatment;
- 9.6.1.2. Any recommended limitations on the employee's use of respirators;
- 9.6.1.3. Any recommended limitations on respirable crystalline silica exposure; and

- 9.6.1.4. A statement that the employee should be examined by a specialist if the B-reader classifies the chest X-ray provided under the silica standard as 1/0 or higher (X-ray evidence of silicosis in employees exposed to respirable crystalline silica), or if the PLHCP otherwise recommends referral to a specialist.

9.7. The PLHCP's Written Medical Opinion for Enterprise Masonry Corporation

- 9.7.1. Enterprise Masonry Corporation will ensure they receive a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion must contain only the following information:
 - 9.7.1.1. The date of the examination;
 - 9.7.1.2. A statement that the examination has met the requirements of the silica standard; and
 - 9.7.1.3. Any recommended limitations on the employee's use of respirators.
- 9.7.2. If the employee gives written authorization, the written medical opinion to Enterprise Masonry Corporation must also contain one or both of the following:
 - 9.7.2.1. Any recommended limitations on the employee's exposure to respirable crystalline silica;
 - 9.7.2.2. A statement that the employee should be examined by a specialist if the B reader classifies the chest X-ray provided under the silica standard as 1/0 or higher (X-ray evidence of silicosis in employees exposed to respirable crystalline silica), or if the PLHCP otherwise recommends referral to a specialist.
- 9.7.3. Enterprise Masonry Corporation will ensure that each employee receives a copy of the written medical opinion within 30 days of each medical examination. The PLHCP can give a copy of the opinion directly to the employee, so long as the time deadline is met. As indicated above, employees can show this opinion to future employers as proof that medical surveillance requirements under the silica standard are current.

9.8. Sample Medical Forms in Appendix B of the Standard

- 9.8.1. Appendix B contains guidelines for PLHCPs and blank sample forms for the medical report for the employee, the medical opinion for the employer, and an authorization form to allow limitations on respirable crystalline silica exposure or recommendations for a specialist examination to be reported to the employer. Enterprise Masonry Corporation will ensure that PLHCPs who will conduct medical examinations required by the silica standard have a copy of the standard, including Appendix B if the PLHCP chosen by the company doesn't already have the necessary information. The purpose of Appendix B is to give PLHCPs medical information and guidance to help them conduct medical examinations that meet the requirements of the silica standard.
- 9.8.2. Examples of completed forms are included in this program on the following pages. Sample Form 1 is a sample of the written medical report that the PLHCP provides to the employee. Enterprise Masonry Corporation does not receive a copy of the written medical report. Sample Form 2 is a sample of the written medical opinion that the PLHCP provides to Enterprise Masonry Corporation. The PLHCP indicates the type of examination and

recommendations on use of a respirator. If the employee signs the written authorization (Sample Form 3) allowing the PLHCP to release further information to Enterprise Masonry Corporation, the PLHCP must include any recommend limitations on exposure to respirable crystalline silica and/or any referral to a specialist.

Sample Form 1: Written Medical Report for Employee

EMPLOYEE NAME: Joe Smith

DATE OF EXAMINATION: June 1, 2017

TYPE OF EXAMINATION: ☒ Initial examination ☐ Periodic examination ☐ Specialist examination

☐ Other: _____

RESULTS OF MEDICAL EXAMINATION:

Physical Examination –	☒ Normal	☐ Abnormal (see below)	☐ Not performed
Chest X-Ray –	☒ Normal	☐ Abnormal (see below)	☐ Not performed
Breathing Test (Spirometry) –	☐ Normal	☒ Abnormal (see below)	☐ Not performed
Test for Tuberculosis –	☒ Normal	☐ Abnormal (see below)	☐ Not performed
Other: _____	☐ Normal	☐ Abnormal (see below)	☐ Not performed

Results reported as abnormal: Breathing test (Spirometry) shows an obstructive pattern.

☒ Your health may be at increased risk from exposure to respirable crystalline silica due to the following:

Continued unprotected exposure to respirable crystalline silica may further damage your lungs.

RECOMMENDATIONS:

☐ No limitations on respirator use

☒ Recommended limitations on use of respirator: A powered air purifying respirator (PAPR) is the only type of respirator you can safely wear. A PAPR will give you higher protection from silica exposure and will decrease strain on your heart and lungs.

☒ Recommended limitations on exposure to respirable crystalline silica: Ideally, you may want to consider a position that doesn't involve exposure to substances hazardous to your lungs, such as respirable crystalline silica. If that is not possible, be sure to always wear a respirator when needed to protect your lungs.

Dates for recommended limitations, if applicable: Indefinitely unless otherwise indicated by a specialist.

☒ I recommend that you be examined by a Board Certified Specialist in Pulmonary Disease or Occupational Medicine

☒ Other recommendations*: See your personal physician about the mole on your neck

Your next periodic examination for silica exposure should be in: ☐ 3 years ☒ Other: 1 year, June 1, 2018

Examining Provider: Dr. Jones

Date: June 1, 2017

(signature)

Provider Name: Dr. Jones Health Clinic

Office Address: 1111 Main Street, Washington, DC

Office Phone: 123-456-7890

*These findings may not be related to respirable crystalline silica exposure or may not be work-related, and therefore may not be covered by the employer. These findings may necessitate follow-up and treatment by your personal physician.

Respirable Crystalline Silica standard (§ 1910.1053 or 1926.1153)

Sample Form 2: Written Medical Opinion for Employer

EMPLOYER: John Doe Renovations

EMPLOYEE NAME: Joe Smith

DATE OF EXAMINATION: June 1, 2017

TYPE OF EXAMINATION:

☒ Initial examination ☐ Periodic examination ☐ Specialist examination

☐ Other: _____

USE OF RESPIRATOR:

☐ No limitations on respirator use

☒ Recommended limitations on use of respirator: A powered air purifying respirator (PAPR) is the only type of respirator Mr. Smith can safely wear.

Dates for recommended limitations, if applicable: Indefinitely, unless otherwise recommended by specialist

The employee has provided written authorization for disclosure of the following to the employer (if applicable):

☒ This employee should be examined by an American Board Certified Specialist in Pulmonary Disease or Occupational Medicine

☐ Recommended limitations on exposure to respirable crystalline silica: _____

Dates for exposure limitations noted above: _____ to _____

MM/DD/YYYY MM/DD/YYYY

NEXT PERIODIC EVALUATION:

☐ 3 years

☒ Other: 1 year, June 1, 2018

Examining Provider: Dr. Jones

(signature)

Date: June 1, 2017

Provider Name: Dr. Jones Health Clinic

Provider's specialty: None, general practitioner

Office Address: 1111 Main Street, Washington, DC

Office Phone: 123-456-7890

☒ I attest that the results have been explained to the employee.

The following is required to be checked by the Physician or other Licensed Health Care Professional (PLHCP):

☒ I attest that this medical examination has met the requirements of the medical surveillance section of the OSHA Respirable Crystalline Silica standard (§ 1910.1053(h) or 1926.1153(h)).

Sample Form 3: Authorization for Crystalline Silica Opinion to Employer

This medical examination for exposure to crystalline silica could reveal a medical condition that results in recommendations for (1) limitations on respirator use, (2) limitations on exposure to crystalline silica, or (3) examination by a specialist in pulmonary disease or occupational medicine. Recommended limitations on respirator use will be included in the written opinion to the employer. If you want your employer to know about limitations on crystalline silica exposure or recommendations for a specialist examination, you will need to give authorization for the written opinion to the employer to include one or both of those recommendations.

I hereby authorize the opinion to the employer to contain the following information, if relevant
(please check all that apply):

☐ Recommendations for limitations on crystalline silica exposure

☒ Recommendation for a specialist examination

OR

☐ I do not authorize the opinion to the employer to contain anything other than recommended limitations on respirator use.

Please read and initial:

X I understand that if I do not authorize my employer to receive the recommendation for specialist examination, the employer will not be responsible for arranging and covering costs of a specialist examination under the OSHA standard for respirable crystalline silica.

Joe Smith
Name (printed)

Joe Smith
Signature

June 1, 2017
Date

9.9. Additional Examinations by a Specialist

- 9.9.1. Enterprise Masonry Corporation will make the specialist examination available within 30 days of receiving the written medical opinion that includes the PLHCP's recommendation for a specialist examination. The specialists will be either an American Board Certified Specialist in Pulmonary Disease or an American Board Certified Specialist in Occupational Medicine.
- 9.9.2. Enterprise Masonry Corporation will ensure the specialist:
 - 9.9.2.1. Receives the same information that the employer is required to provide the PLHCP (*see above*);
 - 9.9.2.2. Explains the results of the medical examination to the employee and provides each employee with a written medical report within 30 days of the examination; and
 - 9.9.2.3. Provides Enterprise Masonry Corporation with a written medical opinion within 30 days of the examination.
- 9.9.3. The specialist's written medical report to the employee must contain the following information:
 - 9.9.3.1. A description of the medical examination results, including any medical condition(s) that may make an employee more sensitive to respirable crystalline silica exposure and any medical conditions that require further evaluation or treatment;
 - 9.9.3.2. Any recommended limitations on the employee's use of respirators; and
 - 9.9.3.3. Any recommended limitations on respirable crystalline silica exposure.
- 9.9.4. The specialist's written medical opinion for Enterprise Masonry Corporation must include only the following:
 - 9.9.4.1. The date of the examination; and
 - 9.9.4.2. Any recommended limitations on the employee's use of respirators.
- 9.9.5. If the employee gives written authorization, the written opinion to Enterprise Masonry Corporation must also contain any recommended limitations on the employee's exposure to respirable crystalline silica.

10. Communication of Hazards

10.1. Enterprise Masonry Corporation will train and inform employees covered by the silica standard about respirable crystalline silica hazards and the methods the company uses to limit their exposures to those hazards. Enterprise Masonry Corporation will cover the cost of training and will pay employees for the time spent in training.

10.2. Training Topics

10.2.1. Enterprise Masonry Corporation will ensure that employees trained under the silica standard can demonstrate knowledge and understanding of at least:

- 10.2.1.1. Health hazards associated with respirable crystalline silica exposure. For respirable crystalline silica, the health hazards include: cancer, lung effects, immune system effects, and kidney effects.
- 10.2.1.2. Specific workplace tasks that could expose employees to respirable crystalline silica. Examples include those listed in Table 1, such as using a stationary masonry saw to cut crystalline silica-containing materials.
- 10.2.1.3. Specific measures Enterprise Masonry Corporation is implementing to protect employees from respirable crystalline silica exposure, including engineering controls, work practices, and respirators to be used.

This training will be specific for the task that each employee performs. For example, employees who operate tools with built-in controls, such as saws with integrated water delivery systems, would need to demonstrate knowledge and understanding of:

- The full and proper use of the controls on those tools; and
- Signs that controls may not be functioning properly.

Laborers who do not operate equipment but are engaged in a task by helping the tool operator would only need to demonstrate knowledge and understanding of:

- The general types of controls used in the workplace, such as water or vacuum controls and how to recognize if those controls are not working properly; and
- Work practices they perform as part of helping the tool operator, such as appropriate clean-up of respirable crystalline silica dust accumulations.

- 10.2.1.4. The contents of the respirable crystalline silica standard. This would involve a description of the standard's requirements.
- 10.2.1.5. The identity of the competent person or persons designated by Enterprise Masonry Corporation. This could be as simple as announcing who the competent person is at the beginning of a work shift.
- 10.2.1.6. The purpose and a description of the medical surveillance program required under the standard. Topics Enterprise Masonry Corporation may communicate to their employees as part of this training include but are not limited to:

- 10.2.1.6.1. The Company will offer medical examinations to employees who are required to wear a respirator under the silica standard for 30 or more days a year;
 - 10.2.1.6.2. The Company will offer medical examinations at no cost to the employee, including additional silica-related tests or specialist examinations recommended by the physician or other licensed health care professional;
 - 10.2.1.6.3. The types of tests included in the medical examinations;
 - 10.2.1.6.4. Symptoms associated with respirable crystalline silica-related diseases;
 - 10.2.1.6.5. Information that must be included in the written medical report to the employee versus the written medical opinion for Enterprise Masonry Corporation;
 - 10.2.1.6.6. Information that must not be included in written medical opinion to Enterprise Masonry Corporation without written authorization from the employee (recommendations for limitations on exposures to silica and for specialist referrals);
 - 10.2.1.6.7. The importance of keeping a copy of the written medical opinion to Enterprise Masonry Corporation as proof of a current medical examination to avoid unnecessary testing; and
 - 10.2.1.6.8. Enterprise Masonry Corporation cannot retaliate or discriminate against employees for participating in medical surveillance.
- 10.2.1.7. Enterprise Masonry will not provide all required training if an employee is already able to demonstrate knowledge and understanding of training topics such as health hazards, the contents of the silica standard, or medical surveillance requirements. However, some site-specific or employer-specific training is always necessary, such as training on specific tasks that could result in exposures in that workplace, specific controls or work practices that Enterprise Masonry Corporation is using, and the identity of the competent person.

10.2.2. When Employees Must be Trained

- 10.2.2.1. Employees will be trained at the time they are assigned to a position involving exposure to respirable crystalline silica.
- 10.2.2.2. Additional training will be provided as often as necessary to ensure that employees know and understand respirable crystalline silica hazards and the protections available in their workplace. Examples of when additional training would be required include:
 - When Enterprise Masonry Corporation asks an employee to perform a task that is new to that employee;
 - When Enterprise Masonry Corporation introduces new protections (for example, an employer who was having employees use a handheld grinder with wet method controls decides to have employees use a handheld grinder with a dust collection system); or
 - When an employee is working in a manner that suggests he or she has forgotten what was learned in training.

10.2.3. Training Methods

- 10.2.3.1. The silica standard does not require Enterprise Masonry Corporation to use any particular method for training employees. Enterprise Masonry Corporation will use hands-on training, videotapes, slide presentations, classroom instruction, informal discussions

during safety meetings, written materials, or any combination of these methods to train employees.

- 10.2.3.2. In order for employees to demonstrate knowledge and understanding of the training subjects, training will be done in a manner and language that employees understand. This may mean, for example, providing materials, instruction, or assistance in Spanish rather than English for Spanish-speaking employees who do not understand English, and using methods other than printed reading materials if the employee is not able to read.
- 10.2.3.3. To ensure that employees understand the material presented during training, Enterprise Masonry Corporation will ensure that trainees have the opportunity to ask questions and receive answers if they do not fully understand the material that is presented to them. If videotape presentations or computer-based programs are used, this requirement will be met by having a qualified trainer available to address questions after the presentation.
- 10.2.3.4. Enterprise Masonry Corporation will determine if employees know and understand the training topics through written tests or oral quizzes if the employee is not able to read and/or write.

10.2.4. Making a Copy of the Standard Available

- 10.2.4.1. Enterprise Masonry Corporation will make a copy of the respirable crystalline silica standard available at no cost to each employee covered by the standard. This program will be included in the Enterprise Masonry Corporation Safety Manual which is required to be kept on each job site at all times. In addition a digital copy will be uploaded to the company's website ensuring availability to every employee at all times.

11. Recordkeeping

- 11.1. Records can demonstrate compliance with the standard, and can assist in diagnosing and identifying workplace-related illnesses. Therefore, Enterprise Masonry Corporation will make and keep records of medical surveillance and training provided under the standard.

11.1.1. Medical Surveillance

- 11.1.1.1. Enterprise Masonry Corporation will make and keep an accurate record for each employee provided medical surveillance under the standard. The record will include the following information about the employee:
- 11.1.1.1.1. Name and social security number;
 - 11.1.1.1.2. A copy of the PLHCPs' and specialists' written opinions; and
 - 11.1.1.1.3. A copy of the information that Enterprise Masonry Corporation is required to provide to the PLHCPs and specialists (*i.e.*, a description of the employee's former, current, and anticipated duties as they relate to crystalline silica exposure; a description of the employee's former, current, and anticipated respirable crystalline silica exposure levels(if not using Table 1); a description of the personal protective equipment used by the employee; and information from previous employment-related medical examinations that is currently within the control of the employer).

11.1.2. Keeping and Making Medical Records Available

- 11.1.2.1. Exposure and medical records will be kept and made available to employees, their representatives, and OSHA in accordance with OSHA's access to employee exposure and medical records regulation.
- 11.1.2.2. A separate OSHA regulation (29 CFR 1910.1020, Access to Employee Exposure and Medical Records) addresses requirements for maintaining exposure and medical records. In general, exposure records (including air monitoring and objective data) must be kept for at least 30 years, and medical records must be kept for at least the duration of employment plus 30 years. It is necessary to keep these records for extended periods because silica-related diseases such as cancer often cannot be detected until several decades after exposure. However, if an employee works for an Enterprise Masonry Corporation for less than one year, the company does not have to keep the medical records after employment ends, as long as the company gives those records to the employee.

FORMS

Three forms are provided. The first is a written medical report for the employee. The second is a written medical opinion for Enterprise Masonry Corporation. And the third is a written authorization form that employees sign to clarify what information the employee is authorizing to be released to the company.

WRITTEN MEDICAL REPORT FOR EMPLOYEE

EMPLOYEE NAME: _____ DATE OF EXAMINATION: _____

TYPE OF EXAMINATION: ☐ Initial examination ☐ Periodic examination ☐ Specialist examination

☐ Other: _____

RESULTS OF MEDICAL EXAMINATION:

Physical Examination –	☐ Normal	☐ Abnormal (see below)	☐ Not performed
Chest X-Ray –	☐ Normal	☐ Abnormal (see below)	☐ Not performed
Breathing Test (Spirometry) –	☐ Normal	☐ Abnormal (see below)	☐ Not performed
Test for Tuberculosis –	☐ Normal	☐ Abnormal (see below)	☐ Not performed
Other: _____	☐ Normal	☐ Abnormal (see below)	☐ Not performed

Results reported as abnormal: _____

☐ Your health may be at increased risk from exposure to respirable crystalline silica due to the following: _____

RECOMMENDATIONS:

☐ No limitations on respirator use

☐ Recommended limitations on use of respirator: _____

☐ Recommended limitations on exposure to respirable crystalline silica: _____

Dates for recommended limitations, if applicable: _____ to _____
MM/DD/YYYY MM/DD/YYYY

☐ I recommend that you be examined by a Board Certified Specialist in Pulmonary Disease or Occupational Medicine

☐ Other recommendations*: _____

Your next periodic examination for silica exposure should be in: ☐ 3 years ☐ Other: _____
MM/DD/YYYY

Examining Provider: _____ Date: _____
(signature)

Provider Name: _____

Office Address: _____ Office Phone: _____

*These findings may not be related to respirable crystalline silica exposure or may not be work-related, and therefore may not be covered by the employer. These findings may necessitate follow-up and treatment by your personal physician. Respirable Crystalline Silica standard (§ 1910.1053 or 1926.1153)

WRITTEN MEDICAL OPINION FOR EMPLOYER

EMPLOYER: _____

EMPLOYEE NAME: _____

DATE OF EXAMINATION: _____

TYPE OF EXAMINATION:

- ☐ Initial examination
☐ Periodic examination
☐ Specialist examination
☐ Other: _____

USE OF RESPIRATOR:

- ☐ No limitations on respirator use
☐ Recommended limitations on use of respirator: _____

Dates for recommended limitations, if applicable: _____ to _____
MM/DD/YYYY MM/DD/YYYY

The employee has provided written authorization for disclosure of the following to the employer (if applicable):

- ☐ This employee should be examined by an American Board Certified Specialist in Pulmonary Disease or Occupational Medicine
☐ Recommended limitations on exposure to respirable crystalline silica: _____

Dates for exposure limitations noted above: _____ to _____
MM/DD/YYYY MM/DD/YYYY

NEXT PERIODIC EVALUATION: ☐ 3 years ☐ Other: _____
MM/DD/YYYY

Examining Provider: _____ Date: _____
(signature)

Provider Name: _____ Provider's specialty: _____

Office Address: _____ Office Phone: _____

☐ I attest that the results have been explained to the employee.

The following is required to be checked by the Physician or other Licensed Health Care Professional (PLHCP):

☐ I attest that this medical examination has met the requirements of the medical surveillance section of the OSHA Respirable Crystalline Silica standard (§ 1910.1053(h) or 1926.1153(h)).

AUTHORIZATION FOR CRYSTALLINE SILICA OPINION TO EMPLOYER

This medical examination for exposure to crystalline silica could reveal a medical condition that results in recommendations for (1) limitations on respirator use, (2) limitations on exposure to crystalline silica, or (3) examination by a specialist in pulmonary disease or occupational medicine. Recommended limitations on respirator use will be included in the written opinion to the employer. If you want your employer to know about limitations on crystalline silica exposure or recommendations for a specialist examination, you will need to give authorization for the written opinion to the employer to include one or both of those recommendations.

I hereby authorize the opinion to the employer to contain the following information, if relevant (please check all that apply):

- ☐ Recommendations for limitations on crystalline silica exposure
- ☐ Recommendation for a specialist examination

OR

- ☐ I do not authorize the opinion to the employer to contain anything other than recommended limitations on respirator use.

Please read and initial:

____ I understand that if I do not authorize my employer to receive the recommendation for specialist examination, the employer will not be responsible for arranging and covering costs of a specialist examination.

Name (printed)

Signature

Date