

## RESPIRABLE CRYSTALLINE SILICA $\text{SiO}_2$ EXPOSURES PROGRAM

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### POLICY

The purpose of this program is to warn employees of the hazards of Respirable Crystalline Silica exposure, preventions and ways to eliminate exposure. Silica exposure at hazardous levels can lead to lung cancer, silicosis, chronic obstructive pulmonary disease, and kidney disease. It is intended to meet the requirements of the Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153) established by the Occupational Safety and Health Administration (OSHA).

### SCOPE

This Respirable Crystalline Silica Program applies to all Winger Companies, herein referred to as Winger, employees who have the potential to be exposed to Respirable Crystalline Silica when covered by the OSHA Standard. The OSHA Respirable Crystalline Silica Construction Standard applies to all occupational exposures to Respirable Crystalline Silica in construction work, except where employee exposure will remain below 25 micrograms of Respirable Crystalline Silica per cubic meter of air ( $25 \mu\text{g}/\text{m}^3$ ) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

### DEFINITIONS

If a definition is not listed in this section, please contact your supervisor. If your supervisor is unaware of what the term means, please contact the Competent Person or your Safety Department.

- ✚ Action Level means a concentration of airborne Respirable Crystalline Silica of  $25 \mu\text{g}/\text{m}^3$ , calculated as an 8-hour TWA.
- ✚ 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.
- ✚ Employee Exposure means the exposure to airborne Respirable Crystalline Silica that would occur if the employee were not using a respirator.
- ✚ High-Efficiency Particulate Air (HEPA) Filter means a filter that is at least 99.97 percent efficient in removing monodispersed particles of 0.3 micrometers in diameter.
- ✚ 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.
- ✚ Permissible Exposure Limit (PEL) means the employer shall ensure that no employee is exposed to an airborne concentration of Respirable Crystalline Silica in excess of  $50 \mu\text{g}/\text{m}^3$ , calculated as an 8-hour TWA.
- ✚ Physician or Other Licensed Health Care Professional (PLHCP) means 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 health care services required by the Medical Surveillance Section of the OSHA Respirable Crystalline Silica Standard.
- ✚ Respirable Crystalline Silica means Quartz, Cristobalite, and/or Tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle size- selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality-Particle Size Fraction Definitions for Health-Related Sampling.  $\text{SiO}_2$  is a white or colorless crystalline compound occurring abundantly as quartz, sand, flint, agate, and many other minerals and used to manufacture a wide variety of materials, especially glass and concrete

- ✚ Specialist means an American Board-Certified Specialist in Pulmonary Disease or an American Board-Certified Specialist in Occupational Medicine.

## DANGERS OF SILICA EXPOSURE

That cloud of dust you see when a worker cuts or grinds concrete, brick, or stone is not just harmless dust. It contains respirable-sized particles of Crystalline Silica (i.e. Respirable Crystalline Silica) and it can kill. Most crystalline silica is in the form of quartz. Common sand is almost 100% quartz. Most concrete and masonry products contain large amounts of sand. Quartz is the most common form of Crystalline Silica. Many materials found on construction sites include Crystalline Silica; including but not limited to – cement, concrete, asphalt, pre-formed structures (inlets, pipe, etc.) and others. Consequently, this program has been developed to address and control these potential exposures to prevent our employees from experiencing the effects of occupational illnesses related to Respirable Crystalline Silica exposure.

Fine, microscopic particles created by cutting and grinding can get deep into the lungs. When you inhale dust, silica particles scar your lungs, causing a disabling, irreversible, and incurable lung disease called silicosis.

Silica is known to cause silicosis, which is a serious lung disease, as well as increase the risk of lung cancer and other systemic diseases. The bad news is that these diseases can be very fatal. The good news is that silicosis is 100% preventable. You can work with silica-containing materials in ways that do not result in exposure to dust.

## FACTS

- ✚ About 2 million workers are exposed to cancer-causing silica dust each year.
- ✚ New Jersey law prohibits dry cutting and dry grinding of masonry materials.
- ✚ Hundreds of workers die of silicosis each year in the U.S. and hundreds more become disabled and are unable to take care of themselves and their families.
- ✚ Since 1968, more than 14,000 workers in the U.S. have died from silicosis.
- ✚ More than one million U.S. workers are at risk of developing silicosis.
- ✚ The construction industry has one of the highest numbers of deaths due to silicosis.

## THREE TYPES OF SILICOSIS

1. **Acute silicosis** – Can occur after only weeks or months of exposure to very high levels of crystalline silica. Death can occur within months.
2. **Accelerated silicosis** – Results from exposure to high levels of crystalline silica and occurs 5 to 10 years after exposure.
3. **Chronic silicosis** – Usually occurs after 10 or more years of exposure to crystalline silica at low levels. This is the most common type of silicosis.

## SYMPTOMS OF SILICOSIS

Silicosis begins with few, if any, symptoms. Once present, these symptoms can include shortness of breath, severe coughing, wheezing, and chest tightness.

Breathing dust containing crystalline silica has also been linked to other diseases such as tuberculosis, kidney disease, and lung cancer. Symptoms can include fever, weight loss, and night sweats. These symptoms can become worse over time, leading to death.

Other known symptoms:

- ✚ Miner's lung with silicosis and tuberculosis

- ✚ Because chronic silicosis is slow to develop, signs and symptoms may not appear until years after exposure
- ✚ Dyspnea (shortness of breath) exacerbated by exertion
- ✚ Cough, often persistent and sometimes severe
- ✚ Fatigue, chest pain, fever, Cyanosis (blue skin)
- ✚ Tachypnea (rapid breathing) which is often labored
- ✚ Loss of appetite and weight loss
- ✚ Gradual dark shallow rifts in nails eventually leading to cracks as protein fibers within nail beds are destroyed

## WAYS YOU CAN BE EXPOSED

Electrical and mechanical construction workers frequently engage in activities that produce respirable silica dust. Whether or not the dust containing silica becomes harmful depends on many factors, including the size of the particles, the concentration of respirable silica being inhaled and the duration of the exposure.

The most common silica dust-generating tasks include drilling, cutting or boring holes in concrete ceilings, walls, floors, or beams to install electrical, piping, ductwork. However, it's important that mechanical construction workers be familiar with all of the activities that could generate respirable silica dust, even if they are not performing the activities themselves. That way they can prevent overexposure to respirable silica dust generated by other trades. For example, if electricians are running conduit or fitters are hanging pipe in an area being used by masons to cut brick and block, there is the potential for overexposure to our employees and any other contractor in the area. The construction activities that are most capable of generating respirable silica dust when performed on silica-containing materials are those that result in cutting, pounding, scraping, grinding or otherwise pulverizing material that contains silica such as:

- |                   |                              |
|-------------------|------------------------------|
| ✚ Sawing          | ✚ Clean-up                   |
| ✚ Chipping        | ✚ Scarifying                 |
| ✚ Tuck pointing   | ✚ Grinding                   |
| ✚ Milling         | ✚ Crushing                   |
| ✚ Polishing       | ✚ Jackhammering              |
| ✚ Needle gunning  | ✚ Installing posts           |
| ✚ Paint Pots      | ✚ Pouring pump / motor bases |
| ✚ Demolition      | ✚ Rotohammering              |
| ✚ Mixing Quikrete | ✚ Scraping monokote          |
| ✚ Floor tiling    | ✚ Sandblasting               |
| ✚ Drilling        | ✚ Other contractors          |

## SILICA-CONTAINING MATERIALS

- |                  |               |
|------------------|---------------|
| ✚ Asphalt        | ✚ Mortar      |
| ✚ Block          | ✚ Pavers      |
| ✚ Brick          | ✚ Roof tiles  |
| ✚ Ceramic tile   | ✚ Sand        |
| ✚ Concrete       | ✚ Slate       |
| ✚ Granite        | ✚ Some siding |
| ✚ Grout          | ✚ Terrazzo    |
| ✚ Joint compound |               |

## THE PREVENTION OF SILICA OVEREXPOSURE

A key component in preventing overexposure to silica and subsequent disease is to have at least one individual on the job site who is capable of recognizing and evaluating situations where overexposure may be occurring.

Occupational Hygiene findings of exposure to crystalline silica dust during concrete finishing in construction settings are scarce due to the dynamic nature of the activity and the existence of many factors. A total of 49 personal respirable dust samples were collected while workers used hand-held grinders. Wind velocity, wind direction, relative humidity and ambient temperature were all factors. Increased wind velocity reduced silica dust concentration significantly. Working upwind reduced exposure somewhat but was not significant. The time-weighted average concentration of silica dust in 69% of the samples exceeded the current recommended threshold limit of 0.05mg/m<sup>3</sup>, indicating a strong need to devise methods for controlling worker's exposure to crystalline silica dust during concrete finishing activities.

The key to preventing silicosis is to keep dust out of the air. Dust controls can be as simple as a water hose to wet the dust before it becomes airborne. Employers and employees should use the following methods to control respirable crystalline silica dust:

- ✚ Recognize when silica dust may be generated and plan ahead to eliminate or control the dust at the source.
- ✚ Provide workers with training that includes information about health effects, work practices, and protective equipment for respirable crystalline silica.
- ✚ Use engineering control such as local exhaust ventilation (with dust collectors) or wet methods to prevent the release of dust into the air, and keep it well maintained.
- ✚ Routinely maintain dust control systems to keep them in good working order.
- ✚ Do not cause dust to become airborne during clean-up. Remove dust from equipment with a water hose or wet-wiping rather than with compressed air.
- ✚ Use vacuums with high-efficiency particulate air (HEPA) filters, or use wet sweeping instead of dry sweeping.
- ✚ Use the dust collection systems available for many types of dust-generating equipment. When purchasing equipment, look for dust controls.
- ✚ Do not use equipment if the dust control system is not working properly.
- ✚ Use equipment that provides water to the blade or grinder when sawing or grinding concrete or masonry. Be sure to only use blades and abrasive wheels that are rated as safe for use with water. Studies show that this reduces exposure by 85%.
- ✚ Keep in mind that dust levels can remain high for some time even after cutting, grinding, or sweeping has stopped.
- ✚ Minimize exposures to nearby workers by using good work practices, such as marking and posting the boundaries of work areas where exposure to airborne dust can occur.
- ✚ Schedule work for workers when dust exposure is a minimum
- ✚ Wear disposable or washable protective clothes at the worksite.
- ✚ Shower if possible and change into clean clothes before leaving the worksite to prevent contamination of cars, homes, and other work areas.
- ✚ Conduct air monitoring to measure worker exposures and ensure that controls are providing adequate protection for workers.
- ✚ Provide annual medical examinations for all workers who may be exposed to respirable crystalline silica.
- ✚ Use proper N95 respiratory protection when engineering controls cannot keep silica exposures below the NIOSH\* Recommended Exposure Limit (REL). Respirators should not be the primary method of protection. If engineering controls cannot keep dust levels below the NIOSH REL, then respirators should be used. Winger supplies all respirator protection at no cost to Winger employees. Only trained and qualified employees will be allowed to wear respirators. Other employees will be transferred to other work locations.

## PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE)

Where respiratory protection is required by this program, Winger will provide each employee an appropriate respirator that complies with the requirements of the company's Respiratory Protection Program and the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Respiratory protection is required where specified by the OSHA Construction Standard 1926.1153, Table 1, for tasks not listed in Table 1, or where the company has not fully and properly implemented the engineering controls, work practices, and respiratory protection described in Table 1. Situations requiring respiratory protection include:

- ✚ Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls;
- ✚ Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible; and
- ✚ During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL.

The following PPE must be worn for tasks involving silica dust **without** engineering controls:

- ✚ Dust goggles
- ✚ Faceshield
- ✚ Hearing protection if sound is over 85 dB
- ✚ Hardhat
- ✚ Cut resistant / Dexterity gloves
- ✚ Safety toed work boots
- ✚ Clean shaven so as to not interfere with the seal of the respirator being worn
- ✚ Half mask respirator or disposable N-, R- or P-95 particulate respirator
- ✚ Ensure each employee wearing a respirator has the following:
  - ✓ Respirator Pulmonary Function test
  - ✓ Respirator Fit Test
  - ✓ Respirator Training

If engineering controls are put in place to reduce the hazard of airborne dust, the following PPE may be worn:

- ✚ Dust goggles
- ✚ Faceshield
- ✚ Hardhat
- ✚ Hearing protection if sound is over 85 dB
- ✚ Cut resistant / Dexterity gloves
- ✚ Safety toed work boots

## RESPONSIBILITIES

Winger Contracting Company, herein referred to as Winger, firmly believes protecting the health and safety of our employees is everyone's responsibility. This responsibility begins with upper management providing the necessary support to properly implement this program. However, all levels of the organization assume some level of responsibility for this program including the following positions.

### SAFETY DEPARTMENT:

- ✚ Conduct job site assessments for Silica containing materials and perform employee Respirable Crystalline Silica hazard assessments in order to determine if an employee's exposure will be above 25 µg/m<sup>3</sup> as an 8-hour TWA under any foreseeable conditions

- ✚ Select and implement into the project's Exposure Control Plan (ECP) the appropriate control measures in accordance with the Construction Tasks identified in OSHA's Construction Standard Table 1; and potentially including (but not limited to) - a written Exposure Control Plan (ECP), exposure monitoring, Hazard Communication training, medical surveillance, housekeeping and others.
- ✚ NOTE: OSHA's Construction Standard Table 1 is a list of 18 common construction tasks along with acceptable exposure control methods and work practices that limit exposure for those tasks.
- ✚ Ensure that the materials, tools, equipment, personal protective equipment (PPE), and other resources (such as worker training) required to fully implement and maintain this Respirable Crystalline Silica Program are in place and readily available if needed.
- ✚ Ensure that Project Managers, Site Managers, Competent Persons, and employees are educated in the hazards of Silica exposure and trained to work safely with Silica in accordance with OSHA's Respirable Crystalline Silica Construction Standard and OSHA's Hazard Communication Standard. Managers and Competent Persons may receive more advanced training than other employees.
- ✚ Maintain written records of training (for example, proper use of respirators), ECPs, inspections (for equipment, PPE, and work methods/practices), medical surveillance (under lock and key), respirator medical clearances (under lock and key) and fit-test results.
- ✚ Conduct an annual review (or more often if conditions change) of the effectiveness of this program and any active project ECP's that extend beyond a year. This includes a review of available dust control technologies to ensure these are selected and used when practical.
- ✚ Coordinate work with other employers and contractors to ensure a safe work environment relative to Silica exposure.

#### **PROJECT MANAGER:**

- ✚ Ensure all applicable elements of this Respirable Crystalline Silica Program are implemented on the project including the selection of a Competent Person.
- ✚ Assist the Safety Department in conduct job site assessments for Silica containing materials and perform employee Respirable Crystalline Silica hazard assessments in order to determine if an ECP, exposure monitoring, and medical surveillance is necessary
- ✚ Assist in the selection and implementation of the appropriate control measures in accordance with the Construction Tasks identified in OSHA's Construction Standard Table 1; and potentially including (but not limited to) - a written Exposure Control Plan (ECP), exposure monitoring, Hazard Communication training, medical surveillance, housekeeping and others.
- ✚ Ensure that employees using respirators have been properly trained, medically cleared, and fit-tested in accordance with the company's Respiratory Protection Program. This process will be documented.
- ✚ Ensure that work is conducted in a manner that minimizes and adequately controls the risk to workers and others. This includes ensuring that workers use appropriate engineering controls, work practices, and wear the necessary PPE.
- ✚ Where there is risk of exposure to Silica dust, verify employees are properly trained on the applicable contents of this program, the project-specific ECP, and the applicable OSHA Standards (such as Hazard Communication). Ensure employees are provided appropriate PPE when conducting such work.

#### **COMPETENT PERSON AND/OR SITE MANAGER (SUPERINTENDENT, FOREMAN, ETC.)**

- ✚ Make frequent and regular inspections of job sites, materials, and equipment to implement the written ECP.
- ✚ Identify existing and foreseeable Respirable Crystalline Silica hazards in the workplace and take prompt corrective measures to eliminate or minimize them.
- ✚ Notify the Project Manager and/or Safety Department of any deficiencies identified during inspections in order to coordinate and facilitate prompt corrective action.
- ✚ Assist the Project Manager and Safety Department in conducting job site assessments for Silica containing materials and perform employee Respirable Crystalline Silica hazard assessments in order to determine if an ECP, exposure monitoring, and medical surveillance is necessary.

## EMPLOYEES:

- ✚ Follow recognized work procedures (such as the Construction Tasks identified in OSHA’s Construction Standard Table 1) as established in the project’s ECP and this program.
- ✚ Use the assigned PPE in an effective and safe manner.
- ✚ Participate in Respirable Crystalline Silica exposure monitoring and the medical surveillance program.
- ✚ Report any unsafe conditions or acts to the Site Manager and/or Competent Person.
- ✚ Report any exposure incidents or any signs or symptoms of Silica illness.
- ✚ If you think you have been exposed to silica dust or begin to notice symptoms such as cough and shortness of breath, you should report any work injuries to your Safety Director and supervisor immediately.

## REQUIREMENTS

### SPECIFIED EXPOSURE CONTROL METHODS

When possible and applicable, Winger will conduct activities with potential Silica exposure to be consistent with OSHA’s Construction Standard Table 1. Supervisors will ensure each employee under their supervision and engaged in a task identified on OSHA’s Construction Standard Table 1 have fully and properly implemented the engineering controls, work practices, and respiratory protection specified for the task on Table 1 (unless Winger has assessed and limited the exposure of the employee to Respirable Crystalline Silica in accordance with the Alternative Exposure Control Methods Section of this program).

The task(s) that could be performed by Winger are identified and highlighted on OSHA’s Construction Standard Table 1 below:

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

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
1	Stationary masonry saws	<ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
2a	Handheld power saws (any blade diameter) when used outdoors	<ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
2b	Handheld power saws (any blade diameter) when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
3	Handheld power saws	<ul style="list-style-type: none"> <li>• Use saw equipped with commercially</li> </ul>	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
	for cutting fiber-cement board (with blade diameter of 8 inches or less) for tasks performed outdoors only	<ul style="list-style-type: none"> <li>available dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.</li> </ul>		
4a	Walk-behind saws when used outdoors	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
4b	Walk-behind saws when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
5	Drivable saws for tasks performed outdoors only	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
6	Rig-mounted core saws or drills	<ul style="list-style-type: none"> <li>Use tool equipped with integrated water delivery system that supplies water to cutting surface.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
7	Handheld and stand-mounted drills (including impact and rotary hammer drills)	<ul style="list-style-type: none"> <li>Use drill equipped with commercially available shroud or cowling with dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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.</li> <li>Use a HEPA-filtered vacuum when cleaning holes.</li> </ul>	None	None
8	Dowel drilling rigs for concrete for tasks performed outdoors	<ul style="list-style-type: none"> <li>Use shroud around drill bit with a dust collection system.</li> </ul>	N95 (or Greater Efficiency)	N95 (or Greater Efficiency)

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
	only	<ul style="list-style-type: none"> <li>Dust collector must have a filter with 99% or greater efficiency and a filter cleaning mechanism.</li> <li>Use a HEPA-filtered vacuum when cleaning holes.</li> </ul>	Filtering Facepiece or Half Mask	Filtering Facepiece or Half Mask
9a	Vehicle-mounted drilling rigs for rock and concrete	<ul style="list-style-type: none"> <li>Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.</li> </ul>	None	None
9b	Vehicle-mounted drilling rigs for rock and concrete	<ul style="list-style-type: none"> <li>Operate from within an enclosed cab and use water for dust suppression on drill bit.</li> </ul>	None	None
10a	Jackhammers and handheld powered chipping tools when used outdoors	<ul style="list-style-type: none"> <li>Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10b	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10c	Jackhammers and handheld powered chipping tools when used outdoors	<ul style="list-style-type: none"> <li>Use tool equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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.</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10d	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use tool equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		mechanism.		
11	Handheld grinders for mortar removal (i.e., tuckpointing)	<ul style="list-style-type: none"> <li>Use grinder equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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.</li> </ul>	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	Powered Air-Purifying Respirator (PAPR) with P100 Filters
12a	Handheld grinders for uses other than mortar removal for tasks performed outdoors only	<ul style="list-style-type: none"> <li>Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
12b	Handheld grinders for uses other than mortar removal when used outdoors	<ul style="list-style-type: none"> <li>Use grinder equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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.</li> </ul>	None	None
12c	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	<ul style="list-style-type: none"> <li>Use grinder equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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.</li> </ul>	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
13a	Walk-behind milling machines and floor grinders	<ul style="list-style-type: none"> <li>Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to</li> </ul>	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		minimize dust emissions.		
<b>13b</b>	Walk-behind milling machines and floor grinders	<ul style="list-style-type: none"> <li>Use machine equipped with dust collection system recommended by the manufacturer.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</li> <li>When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.</li> </ul>	None	None
<b>14</b>	Small drivable milling machines (less than half-lane)	<ul style="list-style-type: none"> <li>Use a machine equipped with supplemental water sprays designed to suppress dust.</li> <li>Water must be combined with a surfactant.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
<b>15a</b>	Large drivable milling machines (half-lane and larger) for cuts of any depth on asphalt only	<ul style="list-style-type: none"> <li>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
<b>15b</b>	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	<ul style="list-style-type: none"> <li>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
<b>15c</b>	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	<ul style="list-style-type: none"> <li>Use a machine equipped with supplemental water spray designed to suppress dust.</li> <li>Water must be combined with a surfactant.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
<b>16</b>	Crushing machines	<ul style="list-style-type: none"> <li>Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points).</li> <li>Operate and maintain machine in accordance with manufacturer's</li> </ul>	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		instructions to minimize dust emissions. <ul style="list-style-type: none"> <li>Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station.</li> </ul>		
<b>17a</b>	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	<ul style="list-style-type: none"> <li>Operate equipment from within an enclosed cab.</li> </ul>	None	None
<b>17b</b>	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	<ul style="list-style-type: none"> <li>When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.</li> </ul>	None	None
<b>18a</b>	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	<ul style="list-style-type: none"> <li>Apply water and/or dust suppressants as necessary to minimize dust emissions.</li> </ul>	None	None
<b>18b</b>	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	<ul style="list-style-type: none"> <li>When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.</li> </ul>	None	None

When implementing the control measures specified in Table 1, Winger shall:

-  For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust.
-  For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust;
-  For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:

- ✓ Is maintained as free as practicable from settled dust;
  - ✓ Has door seals and closing mechanisms that work properly;
  - ✓ Has gaskets and seals that are in good condition and working properly.
  - ✓ Is under positive pressure maintained through continuous delivery of fresh air.
  - ✓ Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0  $\mu\text{m}$  range (e.g., MERV-16 or better); and
  - ✓ Has heating and cooling capabilities.
- ✚ Where an employee performs more than one task included on OSHA's Construction Standard Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.

## ALTERNATIVE EXPOSURE CONTROL METHODS

Alternative Exposure Control Methods apply for tasks not listed in OSHA's Construction Standard Table 1, or where Winger cannot not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1.

First, Winger will assess the exposure of each employee who is or may reasonably be expected to be exposed to Respirable Crystalline Silica at or above the Action Level in accordance with either the Performance Option or the Scheduled Monitoring Option.

- ✚ **Performance Option** – Winger will assess the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to Respirable Crystalline Silica.
- ✚ **Scheduled Monitoring Option:**
  - ✓ Winger will perform initial monitoring to assess the 8-hour TWA exposure for each employee on the basis of one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification, and in each work area. Where several employees perform the same tasks on the same shift and in the same work area, Winger will plan to monitor a representative Winger will sample the employee(s) who are expected to have the highest exposure to Respirable Crystalline Silica.
  - ✓ If initial monitoring indicates that employee exposures are below the Action Level, Winger will probably discontinue monitoring for those employees whose exposures are represented by such monitoring.
  - ✓ Where the most recent exposure monitoring indicates that employee exposures are at or above the Action Level but at or below the PEL, Winger will repeat such monitoring within six months of the most recent monitoring.
  - ✓ Where the most recent exposure monitoring indicates that employee exposures are above the PEL, Winger will repeat such monitoring within three months of the most recent monitoring.
  - ✓ Where the most recent (non-initial) exposure monitoring indicates that employee exposures are below the Action Level, Winger will repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven or more days apart, are below the Action Level, at which time Winger will probably discontinue monitoring for those employees whose exposures are represented by such monitoring, except when a reassessment is required. Winger will reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the Action Level, or when Winger has any reason to believe that new or additional exposures at or above the Action Level have occurred.

Winger will ensure that all Respirable Crystalline Silica samples taken to satisfy the monitoring requirements of this program and OSHA are collected by a qualified individual (i.e. a Certified Industrial Hygienist) and the samples are evaluated by a qualified laboratory (i.e. accredited to ANS/ISO/IEC Standard 17025:2005 with respect to Crystalline Silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs).

Within five working days after completing an exposure assessment, Winger will individually notify each affected employee in writing of the results of that assessment or post the results in an appropriate location accessible to all affected employees.

Whenever an exposure assessment indicates that employee exposure is above the PEL, Winger will describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.

Where air monitoring is performed, Winger will provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to Respirable Crystalline Silica. When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, Winger will provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

Once air monitoring has been performed, Winger will determine its method of compliance based on the monitoring data and the hierarchy of controls. Winger will use engineering and work practice controls to reduce and maintain employee exposure to Respirable Crystalline Silica to or below the PEL, unless Winger can demonstrate that such controls are not feasible. Wherever such feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, Winger will nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them with the use of respiratory protection.

In addition to the requirements of this program, Winger will comply with other programs and OSHA standards (such as 29 CFR 1926.57 [Ventilation]), when applicable where abrasive blasting is conducted using Crystalline Silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain Crystalline Silica.

## **CONTROL METHODS**

Winger will provide control methods that are either consistent with Table 1 or otherwise minimize worker exposures to Silica. These exposure control methods can include engineering controls, work practices, and respiratory protection. A detailed exposure control method will be evaluated, established and implemented when Table 1 is not followed.

## **WRITTEN EXPOSURE CONTROL PLAN**

When employee exposure on a construction project is expected to be at or above the Action Level, a Written Exposure Control Plan (ECP) will be established and implemented. This ECP will contain at least the following elements:

- ✚ A description of the tasks in the workplace that involve exposure to Respirable Crystalline Silica;
- ✚ A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to Respirable Crystalline Silica for each task;
- ✚ A description of the housekeeping measures used to limit employee exposure to Respirable Crystalline Silica; and
- ✚ A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to Respirable Crystalline Silica and their level of exposure, including exposures generated by other employers or sole proprietors.

The written ECP will designate a Competent Person to make frequent and regular inspections of job sites, materials, and equipment to ensure the ECP is implemented.

The written ECP will be reviewed at least annually to evaluate the effectiveness of it and update it as necessary. Having said this, ECP's are project specific and most project durations do not exceed a year. The written ECP will be readily available for examination and copying, upon request, to each employee covered by this program and/or ECP, their designated representatives, and OSHA.

## **MEDICAL SURVEILLANCE**

Medical surveillance will be made available for each employee who will be required to use a respirator for 30 or more days per year due to their Respirable Crystalline Silica exposure. Medical surveillance (i.e. medical examinations and procedures) will be performed by a PLHCP and provided at no cost to the employee at a reasonable time and place.

Winger will make available an initial (baseline) medical examination within 30 days after initial assignment, unless the employee has received a medical examination that meets the requirements of the OSHA Respirable Crystalline Silica Construction Standard within the last three years. The examination shall consist of:

- ✚ A medical and work history, with emphasis on past, present, and anticipated exposure to Respirable Crystalline Silica, dust, and other agents affecting the respiratory system in addition to any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing), history of tuberculosis, and smoking status and history;
- ✚ A physical examination with special emphasis on the respiratory system;
- ✚ A chest X-ray (a single postero-anterior radiographic projection or radiograph of the chest at full inspiration recorded on either film [no less than 14 x 17 inches and no more than 16 x 17 inches] or digital radiography systems) interpreted and classified according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader;
- ✚ A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course;
- ✚ Testing for latent tuberculosis infection; and
- ✚ Any other tests deemed appropriate by the PLHCP.

Winger will make available medical examinations that include the aforementioned procedures (except testing for latent tuberculosis infection) at least every three years. If recommended by the PLHCP, periodic examinations can be more frequently than every three years.

Winger will ensure that the examining PLHCP has a copy of the OSHA Respirable Crystalline Silica Construction Standard, this program, and the following information:

- ✚ A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to Respirable Crystalline Silica;
- ✚ The employee's former, current, and anticipated levels of occupational exposure to Respirable Crystalline Silica;
- ✚ A description of any personal protective equipment (PPE) used or to be used by the employee, including when and for how long the employee has used or will use that equipment; and
- ✚ Information from records of employment-related medical examinations previously provided to the employee and currently within the control of Winger.

Winger will ensure that the PLHCP explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of each medical examination performed. The written report shall contain:

- ✚ A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment;
- ✚ Any recommended limitations on the employee's use of respirators;
- ✚ Any recommended limitations on the employee's exposure to Respirable Crystalline Silica; and
- ✚ A statement that the employee should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP.

Winger will also obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion shall contain only the following in order to protect the employee's privacy:

- ✚ The date of the examination;
- ✚ A statement that the examination has met the requirements of the OSHA Respirable Crystalline Silica Construction Standard; and
- ✚ Any recommended limitations on the employee's use of respirators.

If the employee provides written authorization, the written opinion shall also contain either or both of the following:

- ✚ Any recommended limitations on the employee's exposure to Respirable Crystalline Silica; and/or
- ✚ A statement that the employee should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP.

If the PLHCP's written medical opinion indicates that an employee should be examined by a Specialist, Winger will make available a medical examination by a Specialist within 30 days after receiving the PLHCP's written opinion. Winger will ensure that the examining Specialist is provided with all of the information that the employer is obligated to provide to the PLHCP.

Winger will ensure that the Specialist explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of the examination. The written report will contain:

- ✚ A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment;
- ✚ Any recommended limitations on the employee's use of respirators; and
- ✚ Any recommended limitations on the employee's exposure to respirable crystalline Silica.

In addition, Winger will obtain a written opinion from the Specialist within 30 days of the medical examination. The written opinion shall contain the following:

- ✚ The date of the examination;
- ✚ Any recommended limitations on the employee's use of respirators; and
- ✚ If the employee provides written authorization, the written opinion shall also contain any recommended limitations on the employee's exposure to Respirable Crystalline Silica.

## **HAZARD COMMUNICATION**

Winger will include Respirable Crystalline Silica in the company's Hazard Communication Program established to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Winger will ensure that each employee has access to labels on containers of Crystalline Silica and those containers respective Safety Data Sheets (SDS's).

All employees will be trained in accordance with the provisions of the OSHA Hazard Communication Standard and the Training Section of this program. This training will cover concerns relating to cancer, lung effects, immune system effects, and kidney effects.

Winger will ensure that each employee with the potential to be exposed at or above the Action Level for Respirable Crystalline Silica can demonstrate knowledge and understanding of at least the following:

- ✦ The health hazards associated with exposure to Respirable Crystalline Silica;
- ✦ Specific tasks in the workplace that could result in exposure to Respirable Crystalline Silica;
- ✦ Specific measures Winger has implemented to protect employees from exposure to Respirable Crystalline Silica, including engineering controls, work practices, and respirators to be used
- ✦ The contents of the OSHA Respirable Crystalline Silica Construction Standard;
- ✦ The identity of the Competent Person designated by Winger; and
- ✦ The purpose and a description of the company's Medical Surveillance Program.

Winger will make a copy of the OSHA Respirable Crystalline Silica Construction Standard readily available without cost to any employee who requests it.

## RECORDKEEPING

Winger will make and maintain an accurate record of all exposure measurements taken to assess employee exposure to Respirable Crystalline Silica. This record will include at least the following information:

- ✦ The date of measurement for each sample taken;
- ✦ The task monitored;
- ✦ Sampling and analytical methods used;
- ✦ Number, duration, and results of samples taken
- ✦ Identity of the laboratory that performed the analysis;
- ✦ Type of personal protective equipment (PPE), such as respirators, worn by the employees monitored; and
- ✦ Name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.

Winger will ensure that exposure records are maintained and made available in accordance with 29 CFR 1910.1020. Exposure records will be kept for at least 30 years.

The employer shall make and maintain an accurate record of all objective data relied upon to comply with the requirements of the OSHA Respirable Crystalline Silica Construction Standard. This record shall include at least the following information:

- ✦ The Crystalline Silica-containing material in question;
- ✦ The source of the objective data;
- ✦ The testing protocol and results of testing;
- ✦ A description of the process, task, or activity on which the objective data were based; and
- ✦ Other data relevant to the process, task, activity, material, or exposures on which the objective data were based.

Winger will ensure that objective data are maintained and made available in accordance with 29 CFR 1910.1020. Objective data records will be kept for at least 30 years.

Winger will make and maintain an accurate record for each employee enrolled in the Medical Surveillance portion of this program. The record shall include the following information about the employee:

- ✦ Name and social security number;
- ✦ A copy of the PLHCPs' and/or Specialists' written medical opinions; and
- ✦ A copy of the information provided to the PLHCPs and Specialists.

Winger will ensure that medical records are maintained and made available in accordance with 29 CFR 1910.1020. Medical records will be kept under lock and key 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 employer for less than one year, the employer does not have to keep the medical records after employment ends, as long as the employer gives those records to the employee.

## **PROGRAM EVALUATION**

This program will be reviewed and evaluated on an annual basis by the Safety Department unless changes to operations, the OSHA Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153), or another applicable OSHA Standard require an immediate re-validation of this program.

## **SOURCE CREDITS:**

U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), [www.osha.gov](http://www.osha.gov)  
elcosh Cement & Concrete Training Guide [www.elcosh.org](http://www.elcosh.org)  
New Jersey Department of Health and Senior Services, Public Health Services Branch  
Mechanical Contractors Association of America, [www.mcaa.org](http://www.mcaa.org)  
National Safety Council Safety & Health Magazine October 2012  
EHS Today [www.ehstoday.com](http://www.ehstoday.com)  
SMACNA Sheet Metal and Air Conditioning Contractors' National Association, Safety Listserv, [www.smacna.org](http://www.smacna.org)  
The Annals of Occupational Hygiene Oxford Journals <http://anhyg.oxfordjournals.org>  
Constructors Association of Western Pennsylvania Silica Program Template  
<http://www.cawp.org/services/safety/silica/>

## **DOCUMENT CONTROL:**

Initial Program April 16, 2013  
Revised November 11, 2014  
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