

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

## Respirable Crystalline Silica Program

### INTRODUCTION

The Respirable Crystalline Silica Program was developed to prevent employee exposure to hazardous levels of Respirable Crystalline Silica that could result through construction activities or general industry activities within job locations. Respirable Crystalline 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 Michigan Occupational Safety and Health Administration (MIOSHA) Part 590 (1910.1053 General Industry), Part 690 (1926.1153 Construction) Silica Occupational Health Standards, and the Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153) established by the Occupational Safety and Health Administration (OSHA).

All work involving mixing, crushing, chipping, cutting, drilling, grinding, or similar activities on materials containing Crystalline Silica can lead to the release of respirable-sized particles of Crystalline Silica (i.e. Respirable Crystalline Silica). Crystalline Silica is a basic component of soil, sand, granite and many other minerals. 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.), clay materials 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.

### SCOPE

This Respirable Crystalline Silica Program applies to all Central Michigan University (CMU) employees. The MIOSHA Respirable Crystalline Silica Construction Standard and General Industry Standard applies to all occupational exposures to Respirable Crystalline Silica in construction and general industry 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.

### PROGRAM ADMINISTRATION

CMU 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 implement this program; however, all levels of the organization assume some level of responsibility for this program including the following:

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

Office of Laboratory and Field Safety (OLFS)/Risk Management and Environmental Health and Safety (RMEHS):

- 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  $25 \mu\text{g}/\text{m}^3$  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 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 (see Appendix II, MIOSHA Silica Occupational Health Standards).
- 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 CMU 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.
- Maintain written records of training (for example, proper use of respirators), ECPs, medical surveillance, respirator medical clearances 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 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.

Supervisor Responsibilities:

- Ensure all applicable elements of this Respirable Crystalline Silica Program are implemented in the department or at the worksite.

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- Assist OLFS/ RMEHS in conducting employee exposure control assessments for Silica containing materials 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 university’s Respiratory Protection Program. This process is 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 MIOSHA Standards (such as Hazard Communication). Ensure employees are provided appropriate PPE when conducting such work.
- Identify existing Respirable Crystalline Silica hazards at worksites and take prompt corrective measures to eliminate or minimize them.
- Notify OLFS/RMEHS when a new employee is hired, who will be performing work with potential for exposure to silica. Additionally, any new work process that may expose employees must be evaluated promptly by OLFS/RMEHS.

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, when applicable.

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- Report any unsafe conditions or acts to their supervisor or union representative.
- Report any exposure incidents or any signs or symptoms of Silica illness.

**DEFINITIONS**

- Action Level means a concentration of airborne Respirable Crystalline Silica of  $25\mu\text{g}/\text{m}^3$ , calculated as an 8-hour TWA.
- 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.
- 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.
- 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



**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

International Organization for Standardization (ISO) 7708:1995: Air Quality-Particle Size Fraction Definitions for Health-Related Sampling.

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

**REQUIREMENTS**

Specified Exposure Control Methods

When possible and applicable, the employee 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.

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 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>• Use saw equipped with commercially 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</li> </ul>	None	None

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		greater, and have a filter with 99% or greater efficiency.		
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 only	<ul style="list-style-type: none"> <li>Use shroud around drill bit with a dust collection system.</li> </ul>	N95 (or Greater Efficiency) Filtering	N95 (or Greater Efficiency) Filtering

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		<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>	Facepiece or Half Mask	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> </ul>	N95 (or Greater Efficiency) Filtering	N95 (or Greater Efficiency) Filtering

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		<ul style="list-style-type: none"> <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>	Facepiece or Half Mask	Facepiece or Half Mask
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> </ul>	None	None



**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		<ul style="list-style-type: none"> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>		
13b	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
14	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
15a	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
15b	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
15c	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
16	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> </ul>	None	None

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		<ul style="list-style-type: none"> <li>Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.</li> </ul>		
17a	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
17b	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
18a	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
18b	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

Reference: Occupational Safety and Health Administration 29 CFR 1926.1153

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**



When implementing the control measures specified in Table 1, CMU 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 CMU cannot not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1.

First, OLFS/ RMEHS 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.

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- Performance Option – OLFS/RMEHS will assess the 8-hour TWA exposure for each employee based on any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to Respirable Crystalline Silica.
- Scheduled Monitoring Option:
  - OLFS/RMEHS 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, OLFS/RMEHS will sample representative fraction of these employees. When using representative monitoring, OLFS/RMEHS will sample the employee(s) who are expected to have the highest exposure to Respirable Crystalline Silica.
  - When sufficient air monitoring data indicates that employee exposures are below the Action Level, OLFS/RMEHS will 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, OLFS/RMEHS 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, OLFS/RMEHS 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 at or below the Action Level, OLFS/RMEHS 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 OLFS/RMEHS will discontinue monitoring for those employees whose exposures are represented by such monitoring, except when a reassessment is required. OLFS/RMEHS 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 OLFS/RMEHS has any reason to believe that new or additional exposures at or above the Action Level have occurred.

OLFS/RMEHS 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 and the samples are evaluated by an accredited laboratory.

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

Within fifteen (15) working days after completing air sampling, OLFS/RMEHS will individually notify each affected employee in writing of the results.

Whenever an exposure assessment indicates that employee exposure is above the PEL, OLFS/RMEHS 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, OLFS/RMEHS 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, the department 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, OLFS/RMEHS will determine its method of compliance based on the monitoring data and the hierarchy of controls. The department will use engineering and work practice controls to reduce and maintain employee exposure to Respirable Crystalline Silica to or below the PEL, unless the department 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, the department will nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them with the use of respiratory protection.

Control Methods

The affected department 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. Listed on the following page are control methods to be used when Table 1 is not followed because the equipment does not meet the required engineering controls as listed in Table 1:

Respiratory Protection

Where respiratory protection is required by this program, the department will provide each employee an appropriate respirator that complies with the requirements of CMU'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 Table 1, for tasks not listed in Table 1, or where CMU has not fully and properly implemented the engineering controls, work practices, and respiratory protection described in Table 1. Situations requiring respiratory protection include:

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- 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.

Housekeeping

CMU does not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to Respirable Crystalline Silica unless wet sweeping, HEPA-filtered vacuuming, or other methods that minimize the likelihood of exposure are not feasible.

CMU does not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to employee exposure to Respirable Crystalline Silica unless:

- The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air; or
- No alternative method is feasible.

Written Exposure Control Plan (ECP)

When employee exposure on a work task is expected to be at or above the Action Level, a written 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

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- 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 individuals.

Frequent and regular inspections of job sites, materials, and equipment used will be conducted by the Principle Investigator (PI) or Supervisor to ensure the ECP is implemented.

The written ECP will be reviewed annually and when a change in the process, control equipment, personnel, or work practices occur or when employees have been potentially exposed at or above the action level. The 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 occupationally exposed to respirable crystalline silica at or above the action level for 30 or more days per year, and for each employee who is required to use a respirator due to their Respirable Crystalline Silica exposure. Medical surveillance (i.e. medical examinations and procedures) will be performed by a physician or health-related provider (PLHCP) and provided at no cost to the employee at a reasonable time and place.

CMU requires an initial (baseline) medical examination within 30 days after initial assignment. 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 posterior-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;

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- 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.

CMU will provide medical examinations that include the aforementioned procedures as recommended by the PLHCP.

The Medical Exam Request form will inform the PLHCP of 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 CMU.

CMU 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;



**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- 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.

CMU 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 &/or General Industry Standard; and
- Any recommended limitations on the employee's use of respirators.

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

CMU 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, CMU 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.

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

### Training

CMU will provide initial and annual training on Respirable Crystalline Silica to all employees with potential for silica exposures, in accordance with the provisions of the OSHA Respirable Crystalline Silica standard. This training will cover concerns relating to cancer, lung effects, immune system effects, and kidney effects.

CMU 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 CMU 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 &/or General Industry Standard;
- The identity of the Competent Person designated by OLFS/RMEHS; and
- The purpose and a description of the Medical Surveillance Program.

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

### Recordkeeping

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

- The date of sampling
- The department and location
- Initial or repeat air sampling
- Exposure Control Plan (ECP) completed

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

- Name of employee monitored
- Description of the task monitored
- Controls in place, type of personal protective equipment (PPE), such as respirators, worn by the employees monitored
- Lab report of sample analysis and report to department and employees
- Comments

CMU 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 MIOSHA 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.

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

CMU 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 employee number;
- A copy of the PLHCPs' and/or Specialists' written medical opinions; and
- A copy of the information provided to the PLHCPs and Specialists.

**RESPIRABLE CRYSTALLINE SILICA PROGRAM**

CMU will ensure that medical records are maintained and made available in accordance with 29 CFR 1910.1020 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.

**PROGRAM EVALUATION**

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

**APPLICABLE FORMS**

The following lists applicable forms relating to this program:

Central Michigan University Respirable Silica Dust Exposure Control Form (Hazard Assessment)

Hazard Communication Program

Respiratory Protection Program

**APPENDICES**

APPENDIX A – Outline of Process for Employee Exposure

APPENDIX B - Written Exposure Control Plan (ECP) template

APPENDIX C - Silica Medical Exam Request

APPENDIX D - Silica Exam form (for PLHCP opinion)

APPENDIX E- MIOSHA Standards