Environmental, Health, and Safety
Policies and Procedures
Reviewed/Revised October 2021

SILICA EXPOSURE CONTROL PLAN

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1. PURPOSE

The purpose of this document is to establish and implement a written exposure control plan that identifies tasks involving silica exposure and methods used to protect employees. The University is required to implement the components of the Plan needed to ensure compliance with the Occupational Safety and Health Administration (OSHA) standards applicable to respirable crystalline silica, including 29 CFR 1910.1053 (General Industry Standard) and 29 CFR 1926.1153 (Construction Standard).

2. SCOPE

The Silica Exposure Control Plan applies to all Wake Forest University employees who are exposed to respirable crystalline silica (RCS) at or above the Action Level , as determined by Environmental Health and Safety (EHS) in consultation with their supervisor or as established by this Plan.

3. DEFINITIONS

AL – Action Level: A concentration of airborne respirable crystalline silica of 25 $\mu g/m^3$, calculated as an 8-hour TWA.

PEL – Permissible Exposure Limit: The maximum amount of airborne respirable crystalline silica an employee may be exposed to during a full (8-hr) work shift. The respirable crystalline silica exposure limit is 50 micrograms per cubic meter calculated as an 8-hour TWA.

PPE – Personal protective equipment: PPE includes respirators, work gloves, hard hats, etc. SECM may mandate that respiratory protection be used for certain work tasks.

RCS – Respirable Crystalline Silica: Quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the required ISO characteristics for respirable-particle size- selective samplers.

SECP – Silica Exposure Control Plan: Identifies tasks involving silica exposure and methods used to protect employees and the general public.

SECM – Specified Exposure Control Methods: SECM outline work practices and personal protective equipment requirements for various tasks as outlined by OSHA.

4. RESPONSIBILITIES

A. Directors

1. Ensure supervisors understand their responsibilities for implementing the SECP within each work team, as applicable.

2. Actively support this plan within individual teams.

3. Ensure all employees are required to follow this plan.

4. Provide oversight on departmental operations to determine when work activities may generate RCS that will require review by EHS.

5. Work with supervisors to review all power tool usage to assure compliance with the dust controls established in the SECM. Where respirators are required, supervisors shall only allow employees who have been approved by EHS to use respirators within the past twelve months to perform those tasks.

B. Project Management

All University projects that involve construction, renovation, maintenance or repair work covered by this program shall:

1. Provide oversight of contract operations to determine which work activities may generate RCS that will require review by EHS.

2. Ensure the work practices and procedures used to control exposure to RCS comply with this program.

3. Ensure all reasonable precautions are taken to prevent exposure of bystanders and the general public when work involving RCS is performed.

4. Where the work involving RCS will be performed near the general public and appropriate dust controls cannot be used, area air monitoring may be required. Project Managers shall provide advanced notice to EHS if such monitoring will be needed.

5. Assure contractors establish temporary restricted areas, use dust controls to prevent migration from the worksite, and air supply and returns in the work area are covered when work will be performed near areas occupied by the general public and where respiratory protection is mandated in the SECM.

C. Supervisors

All activities performing construction, renovation, maintenance or repair work covered by this program shall:

1. Implement and ensure procedures are followed in accordance with this plan.

2. Ensure that employees are aware of this plan, instructed on the details of implementation, and provided with the equipment and methods of control (e.g. engineering controls, work practice controls, and respirators) outlined in the SECM.

3. Assure only employees who have been medically cleared by EHS are allowed to use respirators.

4. Notify EHS when work activities are planned that may generate RCS where monitoring may be required. Employee exposure monitoring is *not required* if a task is listed in the SECM section of this program and required engineering controls and work practices are effectively implemented, and PPE is used as listed.

5. Notify EHS when a task must be performed that is not covered in the SECM.

6. Contact EHS to request technical assistance and to evaluate health and safety concerns within their team.

7. Assure temporary restricted areas are established, *dust controls** are used to prevent migration of dust from the worksite, and air supply and returns in the work area are covered when work will be performed near areas occupied by the general public and where respiratory protection is mandated in the SECM.

   **Where dust controls cannot be used, area air monitoring may be required. Supervisors shall provide advanced notice to EHS if such monitoring will be needed.*

D. Environmental, Health, and Safety

1. Establish and maintain the University Silica Exposure Control Plan (SECP).

2. Perform air monitoring for WFU employees to evaluate silica exposures and provide technical assistance with establishing new control measures and developing a worksite or task-specific Exposure Control Plan.

3. Perform audits of work performed to assure compliance with required silica control measures, and to assure Exposure Control Plans are developed and updated, as required.

4. Conduct a documented annual review of the Exposure Control Plan to assure it continues to be effective, update as needed, and communicate any changes to affected personnel.

E. Employees

All departments whose employees are performing work where RCS may be created or released shall coordinate with EHS to have the work activity reviewed and air monitoring performed as necessary. RCS can be created by crushing, drilling, grinding, cutting, sanding or abrading certain types of materials such as sand, stone, mortar and concrete, porcelain and ceramic materials, brick and pottery products, plaster, sheetrock compounds, and refractory materials. RCS may also be found in the clay body and glazes of pottery, released during jewelry production, used in foundries, and may be released when mining, excavating or otherwise disturbing the earth surface. Where exposures of concern are identified by EHS, EHS will work with the department to develop and implement a worksite-specific Exposure Control Plan.

The following table identifies departments and positions who are enrolled employees in the SECP:

Facilities and Campus Services	Construction
Facilities and Campus Services	Maintenance and Utilities

5. PROGRAM REQUIREMENTS

A. Initial Exposure Assessment

Exposure monitoring will be conducted when any employee is or may reasonably be expected to be exposed to RCS at or above the Action Level. Exposure monitoring may also be performed if work covered by this program is being performed near areas occupied by the general public where respiratory protection is required by the SECM, and where other appropriate dust controls cannot be employed.

Employee exposure monitoring is not required if the task is listed in the SECM section of this program *and* the engineering controls, work practices, and PPE are used as listed. Exposure monitoring is also not required if EHS has either objective or historic data that shows employees will not be exposed above the PEL for the task being performed. If a department purchases tools not listed in the SECM that incorporate dust controls, notify EHS so we can obtain the objective data on the effectiveness of the dust controls.

If a task needs to be performed that is not outlined in the SECM of this program, please contact EHS for assistance.

B. Periodic Exposure Assessment

If the most recent results are at or above the Action Level but are below the PEL, monitoring will be repeated every 6 months.

If the most recent results are at or above the PEL, monitoring will be repeated within 3 months.

Periodic exposure monitoring may be discontinued if results from two consecutive sampling periods taken at least 7 days apart show that employee exposure is below the action level.

Monitoring will be conducted whenever a change in the production, process, control equipment, personnel, or work practices may reasonable be expected to result in new or additional exposure at or above the Action Level.

C. Employee Notification

Employee(s) will be notified in writing of the results of the assessment within 15 working days, either individually or posting the results in an appropriate location accessible to all affected employees.

If the result is above the PEL, the notification will include the means that are being taken to reduce the exposure to below the PEL.

D. Regulated and Restricted Areas

A regulated area will be established where work exposures at a fixed location are known to be at or above the PEL on a consistent basis. A temporary restricted area will be established where the task is covered in the Specified Exposure Control Methods section of this program and the task will not be performed regularly in the same area or location.

A regulated area must be separated from other areas in a way that will minimize the number of employees exposed. The following sign will be posted at each entrance to the regulated area:

DANGER
RESPIRABLE CRYSTALLINE SILICA
MAY CAUSE CANCER
CAUSES DAMAGE TO
LUNGS
WEAR RESPIRATORY PROTECTION IN THIS AREA
AUTHORIZED PERSONNEL ONLY

Only employees who have work to perform are allowed to enter a regulated area. All employees entering the regulated area must wear a respirator, regardless of the amount of time spent in the area. Air from the regulated area shall not be recirculated by the building ventilation system unless it is first cleaned by HEPA filtration.

E. Written Exposure Control Plan

When tasks are performed in accordance with this program and the SECM are followed, this program will serve as the Written Exposure Control Plan.

For fixed worksites where exposures above the action level occur on a routine basis, a worksite-specific written Exposure Control Plan must be developed. Please contact EHS for assistance with writing your plan. The plan must be reviewed at least annually.

If a task must be performed that is not addressed by the SECM, exposure monitoring must be performed and a worksite-specific or task-specific exposure control plan must be developed. Please contact EHS for assistance with evaluating task(s) and writing the plan.

F. Engineering and Work Practice Controls

For any work task or work location where the exposure to RCS is above permissible limits, engineering controls (i.e. wet methods, local exhaust ventilation) or work practice controls (i.e. housekeeping, inspections, scheduling) will be implemented to lower exposure as much as possible.

G. Medical Services

Any employee who is exposed above the Action Level for 30 or more days per year will be provided a medical evaluation and other required medical services at no cost. The medical evaluation is performed initially and at least every 3 years, unless the Occupational Physician requires more frequent review. If respirators need to be worn by an employee, the employee must be medically cleared, fitted to the respirator, and trained annually by EHS.

The medical evaluation will include medical and work history, a physical exam, chest x-ray, pulmonary function test, tuberculosis test, and any other test recommended by the Occupation Physician.

H. Hazard Communication

Silica must be included in each department's hazard communication program, as applicable. This includes proper labeling and having a Safety Data Sheet (SDS).

I. Training

Any employee who is exposed to silica above the Action Level is required to complete a silica safety training course on an annual basis.

6. REVIEWS AND AUDITS

A. Departmental Reviews

Each department shall review its department-specific Exposure Control Plan on an annual basis. The review shall consist of determining if the task and controls are still being used as described and if the plan is effective in reducing silica exposure.

B. EHS Audits

EHS will audit each department that maintains a worksite-specific Exposure Control Program on a yearly basis. The audit will cover all aspects of the written program to ensure they are up to date and complete. The audit will also include a walkthrough of the area to check for appropriate labels, warning signs, and housekeeping.

7. SPECIFIED EXPOSURE CONTROL METHODS

For each employee working with materials containing crystalline silica and engaged in a task using the equipment and machines listed below, the supervisor shall assure the engineering controls, work practices, and respiratory protection are effectively used as specified. In all cases, be sure to operate and maintain the tool in accordance with the manufacturer's instructions to minimize dust emissions. If the designated engineering

controls are not available, of if the task is not listed below, do not begin the work and contact EHS for guidance.

Equipment/Task	Engineering and Work Practice Control Methods	Respiratory Protection	
		Enclosed Area	Outside Area
Ring Mounted Core Saw or Drill	Tool Equipped with integrated water delivery system that supplies water to the cutting surface	None	None
Stationary Masonry Saws	Saw equipped with integrated water delivery system that continuously feeds water to the blade	None	None
Drivable Saws	Saw equipped with integrated water delivery system that continuously feeds water to the blade	Can not use saw inside or in enclosed area	None
Handheld Power Saws (any blade diameter)	Saw equipped with integrated water delivery system that continuously feeds water to the blade	<4 hours per shift N95 >4 hours per shift N95	>4 hours per shift None >4 hours per shift N95
Handheld Power Saws for Cutting Fiber-Cement Board (blade diameter 8" or less)	Task may only be performed outdoors. Saw equipped with commercially available dust collection system equipped with HEPA filtration	Not Allowed	None
Ring Mounted Core Saw or Drill	Tool equipped with integrated water delivery system that supplies water to the cutting surface	None	None
Jackhammers and Handheld Power Chipping Tools	Water continuously fed to the point of impact – OR – Commercial shroud or cowling with HEPA filtered dust collection system	<4 hours per shift N95 >4 hours per shift N95	< 4 hours per shift None >4 hours per shift N95
Walk-Behind Milling Machines and Floor Grinders	Water continuously fed to the point of impact – OR – Commercial shroud or cowling with HEPA filtered dust collection system. When used indoors or in an enclosed area, use a HEPA- filtered vacuum to remove loose dust in between passes.	None	None
Heavy Equipment (Grading and Excavating)	Apply water and/or dust suppressants as necessary to minimize dust emissions – OR – when the equipment operator is the only employee engaged in the task, operate equipment from with an enclosed cab.	None	None
Handheld Grinders for Uses Other Than Mortar Removal	Tool equipped with integrated water delivery system that supplies water to the grinding surface – OR – grinder equipped with commercial shroud and HEPA filtered dust collection system	<4 hours per shift None >4 hours per shift N95	<4 hours per shift None >4 hours per shift None

Housekeeping

Dry sweeping or dry brushing of dust containing RCS is not allowed. Instead, use a HEPA filtered vacuum cleaner, followed by wet mopping or wet sweeping as necessary.

Do not use compressed air to clean an employee's clothes that have become soiled with dust containing RCS. Rather, use a HEPA filtered vacuum to remove dust followed by laundering.

8. REVISIONS

REVISION	REVISION DATE