University of North Carolina at Chapel Hill
Standard on Crystalline Silica

Introduction

PURPOSE

The purpose of the crystalline silica standard is to provide a means by which employees can be protected from the hazards associated with silica dust and develop procedures by which employees must follow when there is a potential for silica dust exposure.

Crystalline silica (SiO2) is a very common inorganic compound found in sand, stone, concrete, mortar, glass, bricks, and many other everyday objects. Respirable crystalline silica is created when products that contain crystalline silica are disturbed through tasks such as and not limited to grinding, cutting, chipping, sanding, breaking open rocks in a lab space, art projects, and other processes that could disturb the material.

SCOPE OF APPLICABILITY

This standard applies to all UNC-Chapel Hill (UNC-CH) Faculty, Staff (includes all full-time, part-time, temporary), Students and all contractors working on behalf of the University.

Standard

In accordance with the Occupational Safety and Health Administration (OSHA), the following requirements shall be met.

Equipment/Tool Assessment

OSHA has provided Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica Table 1 as a resource that identifies many tools that would be used to disturb silica containing materials including a guideline to follow.

- **Existing equipment** must have features that match Table 1. This includes integrated water delivery system that continuously feeds water to the blade or cutting surface, tools equipped with commercially available dust collection system that provides manufacturer recommended air flow or greater and have a filter with 99% or greater efficiency or use of tool with commercially available shroud or cowling with dust collection system. If a tool is used to work with materials containing crystalline silica the tool must be monitored to ensure employee safety.
• When purchasing **new equipment**, the new equipment must have the features listed on Table 1 which engineer out potential exposures. This includes integrated water delivery system that continuously feeds water to the blade or cutting surface, tools equipped with commercially available dust collection system that provides manufacturer recommended air flow or greater and have a filter with 99% or greater efficiency or use of tool with commercially available shroud or cowling with dust collection system. If a tool is new and not listed on Table 1 please contact UNC-CH Environment, Health and Safety (EHS) so EHS can monitor the use and ensure a safe workplace.

**Controls**

Controls are mechanisms or procedures implemented to minimize and or eliminate the hazard. The hierarchy of controls are engineering, administrative, and last is personal protective equipment (PPE). Engineering controls are methods that are built into the design of a plant, equipment or process to minimize the hazard. Examples of engineering controls relevant to this standard include integrated water delivery system that continuously feeds water to the blade or cutting surface, tools equipped with commercially available dust collection system that provides manufacturer recommended air flow or greater and have a filter with 99% or greater efficiency or use of tool with commercially available shroud or cowling with dust collection system. Administrative controls are work practices in which employers minimize potential exposure by rotating duties and/or substituting materials which does not contain or has a lower concentration of silica. PPE should be the last control implemented such as respiratory protection.

**Monitoring**

EHS in collaboration with departments/work units will conduct air monitoring for the following: 1) work involving any equipment/task not listed in the OSHA [Table 1](#); 2) any engineering controls, administrative controls or respiratory protection not implemented for Table 1 equipment/tasks; and 3) any task/ process where employees are or are reasonably expected to be exposed at or above the action level of 25 microgram per cubic meter (µg/m³) as an 8-hour Time-Weighted Average (TWA). Monitoring must reflect the exposures of employees on each shift, each job classification and in each work area. EHS will compare monitoring results to the action level and the Permissible Exposure Limit (PEL) of 50 µg/m³ to determine if further monitoring is required per the OSHA silica standards. Exposures will be reassessed whenever a change in the process, equipment, controls, employees, or work practices is reasonably expected to cause exposures to meet or exceed the action level or whenever there is reason to believe new or additional exposures have occurred that meet or exceed the action level.

EHS will notify each affected employee of the results of the exposure assessment within five (5) working days of receiving instantaneous or laboratory results. Notification will be in writing or posted in a location that all affected employees can access and will include corrective action(s) if exposures are at or above the PEL. Affected employees include the employee monitored and represents other employees with similar potential exposure. Affected employees or their designated representatives have the right to observe any air monitoring of employee exposure to respirable crystalline silica. PPE, if required in the work area, will be provided to observers.

**Regulated Areas**

Limit access and post signage in temporary work and adjoining areas indoors that meet or exceed the action level and ensure adequate ventilation and tools are provided in permanent indoor work areas. Limit access by marking off temporary work and adjoining areas outdoors that meet or exceed the action level and posting signage to ensure pedestrians do not interact with the tools, materials, and process that would be creating a
potential hazard.

**Housekeeping Methods**

Employees must avoid certain housekeeping methods when working with silica to prevent unnecessary exposure. OSHA prohibits employees from cleaning by the following methods: 1) dry brushing and sweeping, unless methods such as wet sweeping and HEPA-filtered vacuuming are not feasible; or 2) cleaning of surfaces or clothing with compressed air, unless the compressed air is used together with a ventilation system that effectively captures the dust cloud or no other cleaning method is feasible. A situation where no acceptable cleaning method is feasible will be rare but may include situations where acceptable cleaning methods may cause damage or create a greater hazard in the workplace.

**Respiratory Protection**

For equipment/tasks listed in Table 1, employees will be provided respiratory protection in addition to implementing engineering and administrative controls as outlined. For equipment/tasks/processes not listed in Table 1, the provision of respiratory protection is triggered when monitored exposures exceed the PEL. However, under the hierarchy of controls, feasible engineering controls and administrative controls must be implemented before utilizing respiratory protection to reduce exposures. Respiratory protection is required where exposures exceed the PEL while feasible engineering and work practice controls are in the process of being installed or implemented or when feasible engineering and work practice controls have been implemented but exposures still exceed the PEL. Employees required to wear respiratory protection will be enrolled in the campus respiratory protection program in accordance with the OSHA Respiratory Protection standard (1910.134).

**Training**

Awareness Training will be provided by EHS to ensure employees who could potentially be affected by crystalline silica dust know the hazards and proper procedures for working with silica containing material. The awareness training will contain information on crystalline silica forms, health effects of crystalline silica, examples of materials, precautions to prevent or minimize personnel exposure, housekeeping requirements, medical surveillance, and signage.

Job Specific Training will be provided by the supervisor on proper use of equipment/tasks, ways to mitigate hazards, and appropriate personal protective equipment. Supervisors, with the approval of EHS, will prepare a Job Safety Analysis (JSA) for each job they perform with crystalline silica containing materials. The JSA is designed to give step by step directions for a job, the hazards associated with each step, and how to mitigate the hazards.

**Medical Surveillance**

Employees who utilize respirators as part of their PPE will be placed in the University respiratory protection program which includes annual medical surveillance and fit-testing.

Employees who engage in the disturbance of material containing crystalline silica that are exposed at or above the action level thirty or more days a year will be placed in the Crystalline Silica medical surveillance program which includes chest x-ray and lung function test every three years. Medical evaluation will be performed by the University Employee Occupational Health Clinic (effective June 23, 2020).
Recordkeeping

EHS will maintain all records such as air monitoring and medical surveillance in accordance with OSHA. These records will be made available to employees upon request unless otherwise required.

Definitions

Action Level- A measured level that when exceeded is considered sufficient to warrant regulatory or remedial action to protect employees.

DOL- Department of Labor

OSHA- Occupational Safety and Health Administration

PEL- The permissible exposure limit is a legal limit for exposure to a chemical or physical agent. PEL is usually measured as a time weighted average.

Related Requirements

EXTERNAL REGULATIONS AND CONSEQUENCES

1. OSHA regulates occupational exposure of employees who are involved in working with materials that contain crystalline silica (29 CFR 1910.1053 and 29 CFR 1926.1153).
2. OSHA Respiratory Protection standard (29 CFR 1910.134)
3. NC Department of Labor Occupational Safety and Health Topic: Silica

UNIVERSITY POLICIES, STANDARDS, AND PROCEDURES

1. UNC-CH Policy on OSHA’s Crystalline Silica Standard [insert hyperlink]
2. UNC-CH Crystalline Silica Exposure Control Plan (place holder)

Contact Information

Any questions regarding this standard should be directed to the Department of Environment, Health and Safety:

• EHS Executive Director EHS/Risk Management and/or Workplace Safety Manager
  ◦ Unit: Environment, Health and Safety
  ◦ Web: https://ehs.unc.edu/
  ◦ Phone: 919-962-5507

All revision dates:

Attachments:

UNC-Chapel Hill Policy Submission Form - Crystalline Silica Standard.pdf
## Approval Signatures

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<td>EHS Internal Review</td>
<td>Mary Beth Koza: EHS Director</td>
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