UC Santa Barbara Respirable Crystalline Silica Exposure Control Plan

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I. Purpose/Introduction

UCSB is committed to providing a safe and healthy environment for the campus community. The purpose of this document to prevent harmful exposures to crystalline silica and ensure campus compliance with applicable health and safety regulations.

II. Applicability/Scope

The UCSB Crystalline Silica Exposure Control Plan, through the requirements described in this document, establishes procedures and responsibilities for UCSB faculty, staff, students, and volunteers while engaged in University related activities. This document applies to all campus exposures to respirable crystalline silica (RCS), except where objective data demonstrates that exposure to RCS will remain below 25 micrograms per cubic meter of air (0.025 mg/m^3) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

III. Background

Silica, or silicon dioxide (SiO2), is a mineral that occurs naturally in both crystalline and non-crystalline (amorphous) forms. Quartz is the most abundant form of crystalline silica and the most common mineral found on the earth's crust. Materials such as sand, stone, concrete, and mortar all contain crystalline silica. Crystalline silica is also used in the manufacturing of many products such as glass, pottery, ceramics, bricks, and artificial stone. All forms of respirable crystalline silica (quartz, cristobalite, tridymite) are considered hazardous.

Health Hazards Associated with Silica Exposure

Drilling, crushing, cutting, chipping, breaking, sawing, or polishing materials containing crystalline silica can generate hazardous quantities of RCS particulates. These particles, which are mostly 10 microns in size and smaller, are too small to see but can penetrate to the deepest part of the human lungs when inhaled. Workers who inhale these very small crystalline silica particles are at increased risk of developing serious silica-related diseases, including:

- Silicosis, an incurable lung disease that can lead to disability and death;
- Lung cancer;
- Chronic obstructive pulmonary disease (COPD); and
- Kidney and auto-immune disease.

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

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

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

- Shortness of Breath
- Severe Cough
- Weakness

Potential Exposures to Crystalline Silica at UCSB

Activities which may result in exposure to respirable crystalline silica include, but are not limited to:

- Construction activities:
  - Sandblasting
  - Jack hammering
  - Rock drilling, cutting, chipping or polishing
  - Brick or tile cutting and sawing
  - Concrete drilling, sawing, grinding and polishing
  - Tunneling
  - Demolition
  - Asphalt milling
  - Tuckpointing
- Stone countertop fabrication
- Diatomaceous earth processing
- Pottery production
- Foundry operations
- Mineral processing

IV. Definitions

Action Level - a concentration of airborne respirable crystalline silica of 25 µg/m^3 (0.025 mg/m^3) or greater, calculated using an 8-hour time-weighted average (TWA).

Chief - Chief of the Division of Occupational Safety and Health, or designee.

Competent Person – the individual who is responsible for identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authority to take prompt corrective measures to eliminate or minimize them.

Director - Director of the National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, or designee.

Individual Exposure - exposure to airborne respirable crystalline silica that would occur if the individual were not using a respirator.

High-efficiency Particulate Air (HEPA) Filter - a filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter.

Objective Data - information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating individual 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 current operations.

Permissible Exposure Limit - is the maximum concentration of airborne respirable crystalline silica that an individual may be legally exposed to (50 µg/m^3), calculated using an 8-hour time-weighted average (TWA).

Physician or Other Licensed Health Care Professional (PLHCP) - 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 subsection (h).

Regulated Area - an area, demarcated by the Competent Person, where an individual's exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.

Respirable Crystalline Silica (RCS) - means airborne particles quartz, cristobalite, or tridymite 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.

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

V. Responsibilities

A. Department Heads and Chairpersons

Directors and Department Chairs are responsible for:

- Providing the necessary resources to ensure the health and safety of their employees;
- Identifying individuals as supervisors and ensuring they understand their health and safety responsibilities;
- Ensuring departmental compliance with campus health and safety policies and procedures;
- Ensuring workplace hazards are identified and adequately controlled.

B. Competent Persons (Managers, Supervisors, and Principal Investigators)

Supervisors of individuals who may be exposed to Respirable crystalline silica are responsible for:

- Identifying existing and foreseeable respirable crystalline silica hazards in the workplace and taking prompt corrective measures to eliminate or minimize them;
- Ensuring their units understand and comply with the requirements of this document;
- Developing and implementing local procedures to comply with the requirements of this document as needed;
- Ensuring an up-to-date Inventory of Tasks Performed with Materials Containing Crystalline Silica form (Appendix A) has been submitted to the Office of Environmental Health and Safety (EH&S) for their unit, if applicable;
- Maintaining and implementing an up to date Local Exposure Control Plan;
- Conducting frequent and regular inspections of job sites, materials, and equipment to ensure proper implementation of the written exposure control plan.
- Ensuring that all workers (under the supervisor’s direction and control) have received the necessary education and training. As appropriate, each supervisor must ensure that workers are available to “demonstrate competency” for identified tasks;
- Ensuring that all tools, equipment, PPE, and materials (including water) necessary to implement the Local Exposure Control Plan are available (and in proper working order) prior to allowing work activities to commence;
- Ensuring that workers adhere to the Local Exposure Control Plan, including PPE and personal hygiene (i.e., no facial hair where the respirator seals to the user’s face) requirements;
- Ensuring individuals who will be occupationally exposed to respirable crystalline silica at or above the action level for 30 or more days per year are included in the UCSB Silica Medical Surveillance Program.

C. Employees, Students, Visitors, and Volunteers

Employees, Students, Visitors, and Volunteers are responsible for:

- Understanding and complying with campus health and safety policies and procedures;
- Notifying their supervisor or EH&S about any hazardous conditions observed on the worksite including potential exposures to crystalline silica;
- Using the assigned protective equipment in an effective and safe manner;
- Working in accordance with the project/task-specific Exposure Control Plan.

D. Environmental, Health and Safety (EH&S)

The UCSB Crystalline Silica Exposure Control Plan is administered by EH&S Industrial Hygiene Services. EH&S will function as a technical resource for the campus and assist campus personnel in carrying out their responsibilities as needed. Specifically, EH&S is responsible for:

- Developing and maintaining the UCSB Crystalline Silica Exposure Control Plan, and ensuring it meets applicable regulatory requirements;
- Reviewing and evaluating the effectiveness of the campus written UCSB Crystalline Silica Exposure Control Plan at least annually and updating it as necessary;
- Reviewing completed Inventory of Tasks Performed with Materials Containing Crystalline Silica forms (Appendix A) and performing exposure assessments and monitoring as required;
- Reviewing and recommending exposure controls;
- Maintaining applicable records (i.e., exposure monitoring, inspections, respirator fit tests, training records, etc.) in accordance with applicable requirements.

VI. Inventory of Tasks Performed with Materials Containing Crystalline Silica

Supervisors of individuals who may be exposed to RCS are responsible for ensuring an up to date and accurate Inventory of Tasks Performed with Materials Containing Crystalline Silica form (Appendix A) has been submitted to EH&S Industrial Hygiene Services. EH&S Industrial Hygiene Services will review these forms and notify the supervisor in writing if further action is required. Supervisors must notify EH&S Industrial Hygiene Services whenever a task is no longer performs, a new task is added, or there is a change in an existing task that may result in increased exposure to respirable crystalline silica.

VII. Exposure Assessments

Exposure assessments of each individual who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level will be performed by EH&S in accordance with either the performance option or the scheduled monitoring option outlined below. No individual shall be exposed to an airborne concentration of respirable crystalline silica in excess of 50 µg/m^3 (0.05 mg/m^3), calculated as an 8-hour TWA.

Performance Option

Individual 8-hour TWA exposure is assessed using sufficient air monitoring data and/or objective data to accurately characterize exposures to respirable crystalline silica.

Scheduled Monitoring Option

Individual 8-hour TWA exposure is assessed based on one or more personal breathing zone air samples that reflect the exposures of individuals on each shift, for each job classification, in each work area. Where several individuals perform the same tasks on the same shift and in the same work area, a representative fraction of these individuals may be monitored to meet this requirement. In representative sampling, individuals who are expected to have the highest exposure to respirable crystalline silica will be sampled. If initial monitoring indicates that individual exposures are below the action level, monitoring may be discontinued for those individuals whose exposures are represented by such monitoring. Where the most recent monitoring indicates that individual exposures are at or above the action level but at or below the PEL, monitoring will be repeated within six months or as soon as reasonably practicable. Where the most recent monitoring indicates that individual exposures are above the PEL, monitoring will be repeated within three months or as soon as reasonably practicable. Where the most recent (non-initial) monitoring indicates that individual exposures are below the action level, monitoring will be repeated within six months or as soon as reasonably practicable, until two consecutive measurements, taken 7 or more days apart are below the action level, at which time monitoring for those individuals whose exposures are represented by such monitoring may be discontinued.

Reassessment of Exposures

Competent Persons must notify EH&S whenever a change in the production, process, control equipment, personnel, or work practices occurs that may reasonably be expected to result in new or additional exposures at or above the action level, so that exposure levels may be reassessed.

Methods of Sample Analysis

All samples taken will be evaluated by a laboratory that analyzes air samples for respirable crystalline silica in accordance with the procedures in CCR, Title 8, Section 5204, Appendix A.

Individual Notification of Assessment Results

Individuals will be notified of the results of an exposure assessment in writing, within 15 working days of the completion of the assessment. Whenever an exposure assessment indicates that an individual's exposure is above the PEL, a written notification the corrective action(s) that will be implemented to reduce the individual's exposure to or below the PEL must also be provided.

Observation of Monitoring

Affected individuals or their designated representatives may observe monitoring conducted to determine exposures 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, protective clothing and equipment must be provided to the observer(s) at no cost, and use of such clothing and equipment must be ensured.

Recordkeeping - Air Monitoring Data

Accurate records of all exposure measurements will be made and maintained by EH&S. Records will include at least the following information:

1. The date of measurement for each sample taken;
2. The task monitored;
3. Sampling and analytical methods used;
4. Number, duration, and results of samples taken;

5. Identity of the laboratory that performed the analysis;
6. Type of personal protective equipment, such as respirators, worn by the individuals monitored; and
7. Name, social security or other identifying number, and job classification of the individual(s) represented by the monitoring.

EH&S will make and maintain accurate records of all objective data, these records will include at least the following information:

1. The crystalline silica-containing material in question;
2. The source of the objective data;
3. The testing protocol and results of testing;
4. A description of the process, task, or activity on which the objective data were based; and
5. Other data relevant to the process, task, activity, material, or exposures on which the objective data were based.

All records will be maintained and made available in accordance with Section 3204.

VIII. Controls

Engineering and administrative controls will be implemented to reduce and maintain individual exposure to respirable crystalline silica below the PEL unless it can demonstrate that such controls are not feasible. Whenever engineering and administrative controls are not sufficient to reduce exposures below the PEL, these controls must still be implemented to reduce individual's exposure to the lowest level feasible and must be supplemented with the use of respiratory protection that complies with the requirements of the UCSB Respiratory Protection Program and applicable regulatory requirements. Competent Persons are responsible for ensuring that adequate controls are implemented at all times.

Competent Persons must ensure that the engineering controls, work practices, and respiratory protection specified in Appendix B (CCR, Title 8, Section 1532.3, Table 1 - Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica) are fully and properly implemented, unless it has been determined through a documented exposure assessment that individual exposures during such tasks are below the Action Level.

A. Elimination and Substitution

Competent Persons must eliminate, or substitute products containing crystalline silica with products that do not contain or contain a lower percentage of crystalline silica, whenever possible. During the planning phases of a project, departments and their supervisors must advocate for the use of methods that reduce the need for cutting, grinding, or drilling of silica containing materials. EH&S will act as a technical resource for the campus and reviewing and recommend potential alternatives where available.

B. Engineering Controls

The use of engineering controls must be evaluated when hazards cannot be eliminated or reduced to acceptable levels. The best time to introduce engineering controls is when a facility or process is in the design phase; however, engineering controls may be implemented at any time. Engineering controls for RCS are available for a wide range of tools, equipment and processes, with local exhaust ventilation and wet control methods being the most common technologies utilized.

Local Exhaust Ventilation (LEV) Systems

There are commercially available LEV systems for many different types of equipment, such as jackhammers, drills, chisels, concrete breakers, saws, sanders, concrete floor polishers, hand grinders and asphalt milling machines. Most systems are relatively simple, consisting of a shroud assembly with a hose attachment for a vacuum unit. These systems typically function by capturing dust-laden air using the shroud and vacuum assembly, and then remove contaminants using mechanical filtration. Supervisors must ensure the following when LEV controls for RCS are used:

- Only high-efficiency particulate air (HEPA) filtration systems, or high quality multi-stage vacuum units approved for RCS are used.
- Units are used and maintained in accordance with the manufacturer's recommendations.
- Systems are designed to capture RCS dust as close to the source as possible.
- Grinding wheels are operated at the manufacturer's recommended speed *(operating in excess of this can generate significantly higher airborne dust levels)*.

Wet Control Methods and Wet Dust Suppression (WDS) Systems

Wet methods to control RCS are commercially available for tools such as drills, saws, grinders and polishers***.*** These systems commonly use spray nozzles to apply water and/or chemicals such as wetting, foaming and binding agents to dust particles. However, the system configuration varies depending on the goal – dust prevention or airborne dust suppression. When WDS Systems are not available, similar effects can also be achieved by manually wetting the work surface. Supervisors must ensure the following when wet control methods for RCS are used:

- Electrical equipment is used safely, and is specifically designed to be used in such circumstances.
- Units are used and maintained in accordance with the manufacturer's recommendations.
- Tools that provide water directly to the blade are used when cutting, if possible.
- Wet slurry is cleaned from work surfaces as needed.
- Procedures for providing water at the worksite are developed and implemented when water is not readily available. Water should be of potable quality.
- Concrete grinding is performed when concrete is wet whenever possible in order to reduce the amount of dust generated.

Engineering Control Resources

CDC Resources (https://www.cdc.gov/niosh/topics/silica/constructioncontrolmain.html)

Engineering Controls for Silica in Construction - Concrete Grinder

Engineering Controls for Silica in Construction - Cut-off Saws

Engineering Controls for Silica in Construction – Jackhammers

Engineering Controls for Silica in Construction - Tuckpointing

Reducing Hazardous Dust Exposure When Cutting Fiber-Cement Siding

OSHA Fact Sheets (https://www.osha.gov/pls/publications/publication.AthruZ?pType=Types&pID=2)

Crushing Machines Fact Sheet (OSHA FS-3935 - 2017) (English: PDF)

Dowel Drilling Rigs for Concrete Fact Sheet (OSHA FS-3930 - 2017) (English: PDF)

Drivable Saws Fact Sheet (OSHA FS-3928 - 2017) (English: PDF)

Fiber-Cement Board Fact Sheet (OSHA FS-3927 - 2017) (English: PDF)

Handheld and Stand-Mounted Drills Fact S (heet (OSHA FS-3630 - 2017) (English: PDF)

Handheld Grinders for Mortar Removal (Tuckpointing) Fact Sheet (OSHA FS-3632 - 2017) (English: PDF)

Handheld Grinders for Tasks Other Than Mortar Removal Fact Sheet (OSHA FS-3628 - 2017) (English: PDF)

Handheld Power Saws Fact Sheet (OSHA FS-3627 - 2017) (English: PDF)

Heavy Equipment and Utility Vehicles Used During Demolition Activities Fact Sheet (OSHA FS-3936 - 2017) (English: PDF)

Heavy Equipment and Utility Vehicles Used for Grading and Excavating Tasks Fact Sheet (OSHA FS-3937 - 2017) (English: PDF)

Jackhammers or Handheld Powered Chipping Tools Fact Sheet (OSHA FS-3629 - 2017) (English: PDF)

Large Drivable Milling Machines (Half Lane and Larger) Fact Sheet (OSHA FS-3934 - 2017) (English: PDF)

Overview of Standard Fact Sheet (OSHA FS 3681 - 2017) (English: PDF)

Rig-Mounted Core Saws or Drills Fact Sheet (OSHA FS-3929 - 2017) (English: PDF)

Small Drivable Milling Machines (Less than Half Lane) Fact Sheet (OSHA FS-3933 - 2017) (English: PDF)

Stationary Masonry Saws Fact Sheet (OSHA FS-3631 - 2017) (English: PDF)

Vehicle-Mounted Drilling Rigs for Rock and Concrete Fact Sheet (OSHA FS-3931 - 2017) (English: PDF)

Walk-Behind Milling Machines and Floor Grinders Fact Sheet (OSHA FS-3932 - 2017) (English: PDF)

Walk-Behind Saws Fact Sheet (OSHA FS-3633 - 2017) (English: PDF)

C. Local Exposure Control Plans

Supervisors must ensure that they have readily available one or more written Local Exposure Control Plans that contain at least the following elements:

1. A description of the tasks in the workplace that involve exposure to respirable crystalline silica;
2. A description of the engineering controls, work practices, and respiratory protection used to limit individual exposure to respirable crystalline silica for each task; and
3. A description of the housekeeping measures used to limit individual exposure to respirable crystalline silica. Dry sweeping or dry brushing where such activity could

contribute to individual exposure to respirable crystalline silica must not be allowed unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure are not feasible. Supervisors will not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to individual 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.

4. A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of individuals exposed to respirable crystalline silica and their level of exposure, including exposures generated by other employers or sole proprietors.

Supervisors must review and evaluate the effectiveness of their Local Exposure Control Plan(s) at least annually and update it as necessary. Changes in individual exposure and/or exposure control plans must be reported to EH&S Program Administrator immediately. Supervisors must make their Local Exposure Control Plan(s) readily available for examination and copying, upon request, to each individual covered by this section, their designated representatives, the Chief and the Director.

D. Regulated Areas

Competent Persons must establish a regulated area wherever exposures to airborne concentrations of respirable crystalline silica is, or can reasonably be expected to be, in excess of the PEL. The Competent Person must demarcate regulated areas from the rest of the workplace in a manner that minimizes the number of individuals exposed to respirable crystalline silica within the regulated area. Competent Persons must limit access to regulated areas to:

1. Individuals authorized by the Competent Person and required by work duties to be present in the regulated area.
2. Designated representatives of individuals for the purpose of exercising the right to observe monitoring procedures
3. Individuals authorized by the Occupational Safety and Health Act or regulations issued under it to be in a regulated area.

The Competent Person must ensure that individuals wear appropriate respiratory protection equipment while within a regulated area.

Signage

The Competent Person must ensure signs are posted at all entrances to regulated areas that bear the following legend:

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

E. Respiratory Protection

Supervisors must ensure that individuals who are required to wear respiratory protection are enrolled in the UCSB Respiratory Protection Program. Respiratory protection is required:

1. Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls;
2. Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible;
3. During tasks for which the Competent Person has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL; and
4. During periods when the individual is in a regulated area.

IX. Hazard Communication and Training

Supervisors must ensure that individuals who may be exposed to respirable crystalline silica receive documented training covering hazards of exposure and proper use of controls. At a minimum, training must address:

1. The health hazards associated with exposure to respirable crystalline silica;
2. Specific tasks in the workplace that could result in exposure to respirable crystalline silica;
3. The information included on labels of containers of crystalline silica and location of safety data sheets, where applicable;
4. Specific measures implemented to protect individuals from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used;
5. The contents of the Cal/OSHA Respirable Crystalline Silica standard;
6. The identity of the local Competent Person; and
7. The purpose and a description of the medical surveillance program.

X. Abrasive Blasting

Abrasive blasting operations must comply with other Title 8 standards, when applicable, such as Section 5143 (General Requirements of Mechanical Ventilation Systems) and Section 5151 (Ventilation and Personal Protective Equipment Requirements for Abrasive Blasting Operations), where abrasive blasting is conducted using crystalline silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.

XI. Medical Surveillance

Individuals who will be occupationally exposed to respirable crystalline silica at or above the action level for 30 or more days per year must be included in the UCSB Silica Medical Surveillance Program. Competent Persons must ensure that medical surveillance is available at no cost to the individual, and medical evaluations are performed at a reasonable time and place. Where required, the following medical examinations and procedures required by this section must be performed by a Physician or Other Licensed Health Care Professional (PLHCP). The Competent Person must ensure that the PLHCP has an up to date version of the Cal/OSHA Respirable Silica Standard provided along with the following information:

1. A description of the individual's former, current, and anticipated duties as they relate to occupational respirable crystalline silica exposure;

2. The individual's former, current, and anticipated levels of exposure to respirable crystalline silica;
3. A description of any personal protective equipment used or to be used by the individual, including when and for how long the individual has used or will use that equipment; and
4. Information from records of employment-related medical examinations previously provided to the individual and currently within the control of the University.

A. Initial Examination

The Competent Person must ensure that an initial (baseline) medical examination is performed within 30 days of initial assignment, unless the individual has received a medical examination that meets the requirements of this section within the last three years. The examination must consist of:

1. 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; 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;
2. A physical examination with special emphasis on the respiratory system;
3. A chest X-ray (a single posteroanterior 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 Pneumoconioses by a NIOSH-certified B Reader;
4. A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV_1) and FEV_1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course;
5. Testing for latent tuberculosis infection; and
6. Any other tests deemed appropriate by the PLHCP.

B. Periodic Examinations

The Competent Person must make available medical examinations that include the procedures described in the initial examination section (except testing for latent tuberculosis infection) at least every three years, or more frequently if recommended by the PLHCP.

C. Medical Reports and Opinions

The Competent Person must ensure that the PLHCP explains to the individual the results of the medical examination and provides them with a written medical report within 30 days of each medical examination performed. The written report must contain:

1. A statement indicating the results of the medical examination, including any medical condition(s) that would place the individual at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment;
2. Any recommended limitations on the individual's use of respirators;
3. Any recommended limitations on the individual's exposure to respirable crystalline silica; and
4. A statement that the individual should be examined by a specialist if the chest X-ray provided in accordance with this section is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

The Competent Person must also obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The Competent Person must ensure that each individual receives a copy of the written medical opinion described within 30 days of each medical examination performed. The written opinion must contain only the following:

1. The date of the examination;
2. A statement that the examination has met the requirements of this section; and
3. Any recommended limitations on the individual's use of respirators.

If the individual provides written authorization, the written opinion must also contain either or both of the following:

1. Any recommended limitations on the individual's exposure to respirable crystalline silica;
2. A statement that the individual should be examined by a specialist if the chest X-ray provided is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.

D. Additional Examinations

If the PLHCP's written medical opinion indicates that an individual should be examined by a specialist, the Competent Person must make available a medical examination by a specialist within 30 days after receiving the PLHCP's written opinion. The Competent Person must ensure that the examining specialist is provided with all of the information that is required under applicable regulations. The Competent Person must ensure that the specialist explains the results of the medical examination to the individual and provides the individual and Competent Person with a written medical report within 30 days of the examination.

XII. Issued By and Next Review Date

Issued by: Jesse Bickley, Industrial Hygiene Services Manager, CIH, CSP
Date: March 10, 2020
Review Date: Annually

XIII. Attachments

Attachment A: Inventory of Tasks Performed with Materials Containing Crystalline Silica
Attachment B: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Attachment A

Inventory of Tasks Performed with Materials Containing Crystalline Silica

Department/Unit: _____ **Date:** _____

Competent Person: _____ **Title:** _____

Equipment/Task	Location (Indoor, Outdoor or Both)	Approx. Hours per shift
(i) Stationary masonry saws		
(ii) Handheld power saws (any blade diameter)		
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)		
(iv) Walk-behind saws		
(v) Drivable saws		
(vi) Rig-mounted core saws or drills		
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)		
(viii) Dowel drilling rigs for concrete		
(ix) Vehicle-mounted drilling rigs for rock and concrete		
(x) Jackhammers and handheld powered chipping tools		
(xi) Handheld grinders for mortar removal (*i.e.*, tuckpointing)		
(xii) Handheld grinders for uses other than mortar removal		
(xiii) Walk-behind milling machines and floor grinders		
(xiv) Small drivable milling machines (less than half-lane)		
(xv) Large drivable milling machines (half-lane and larger)		
(xvi) Crushing machines		
(xvii) 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		
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials		
(xviv) Water filtration work or other tasks that may result in exposures to Celatom Flux and/or calcinated diatomaceous earth		
Other (please list):		

Attachment B

Required Exposure Control Methods When Working With Materials Containing Crystalline Silica

Supervisors must ensure the full and proper implementation of engineering controls, work practices, and respiratory protection specified in the table below unless it has been determined through a documented exposure assessment that individual exposures during such tasks are below the Action Level. When implementing required control measures, supervisors must ensure:

1. When tasks are performed indoors or in enclosed areas, a means of exhaust is utilized, as needed, to minimize the accumulation of visible airborne dust;
2. For tasks performed using wet methods, water is applied at flow rates sufficient to minimize the release of visible dust;
3. For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:
    a. Is maintained as free as practicable from settled dust;
    b. Has door seals and closing mechanisms that work properly;
    c. Has gaskets and seals that are in good condition and working properly;
    d. Is under positive pressure maintained through continuous delivery of fresh air;
    e. Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (*e.g.,* MERV-16 or better); and
    f. Has heating and cooling capabilities.

Where an individual performs more than one task listed below 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 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.

Equipment or Task	***Engineering and Work Practice Control Methods***	***Required respiratory protection and minimum assigned protection factor (APR)***	
		≤ 4 hours per shift	***> 4 hours per shift***
1. Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
2. Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10

3. Handheld power saws for cutting fiber-cement board (blade diameter of 8 inches or less)	For tasks performed outdoors only: Use saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None
4. Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		
	-When used outdoors	None	None
	-When used indoors or in an enclosed area	APF 10	APF 10
5. Drivable saws	For tasks performed outdoors only: Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
6. Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
7. Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use drill equipped with commercially available shroud or cowling with dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	None	None
8. Dowel drilling rigs for concrete	For tasks performed outdoors only: Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	APF 10	APF 10
9. Vehicle-mounted drilling rigs for rock and concrete	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 – OR - Operate from within an enclosed cab and use water for dust suppression on drill bit.	None	None

10. Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
	Use tool equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism:		
	-When used outdoors	None	APF 10
	-When used indoors or in an enclosed area	APF 10	APF 10
11. Handheld grinders for mortar removal (*i.e.,* tuck pointing)	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter cleaning mechanism.	APF 10	APF 25
12. Handheld grinders for uses other than mortar removal	For tasks performed outdoors only: Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism:		
	-When used outdoors	None	None
	-When used indoors or in an enclosed area	None	APF 10
13. Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in	None	None

	accordance with manufacturer's instructions to minimize dust emissions.		
	Use machine equipped with dust collection system recommended by the manufacturer. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. 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. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	None	None
14. Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None
15. Large drivable milling machines (half-lane and larger)	For cuts of any depth on asphalt only: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions.	None	None
	For cuts of four inches in depth or less on any substrate: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions, OR	None	None
	Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None
16. Crushing machines	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). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.	None	None

17. 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	Operate equipment from within an enclosed cab When individuals outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18. Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions, OR	None	None
	When the equipment operator is the only individual engaged in the task, operate equipment from within an enclosed cab.	None	None