

Respirable Crystalline Silica **Exposure Control Plan**



California State University, Chico

Department of Environmental Health and Safety

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REVISION PAGE**Respiratory Protection Plan Record of Revisions**

Revision	By	Date	Description of Revision
1	HS	11-21-19	Review of Plan, no changes made.
2	HS	02-04-20	Review of Plan, no changes made.
3	HS	03-29-21	Review of Plan, no changes made.
4	HS	4-29-22	Plan and effectiveness review. Updated responsibilities and introduction section.

Legend:

HS: Holly Swan, Industrial Hygienist/Environmental Programs Manager

1.0

INTRODUCTION

It is the goal of California State University, Chico (the “University”) to maintain, as far as is reasonably possible, an environment that will not adversely affect the health, safety, and wellbeing of students, employees, visitors, and the surrounding community. To this end, the University has established a Respirable Crystalline Silica Exposure Control Plan.

1.1 Overview

Crystalline silica (defined as quartz, cristobalite, and/or tridymite) is a commonly found mineral in naturally occurring materials and used in many industrial and construction products. Materials like sand, concrete, stone, and mortar contain crystalline silica. It’s also used to make products such as glass, pottery, ceramics, bricks, concrete, and artificial stone. Crystalline silica becomes respirable (airborne) when disturbed by cutting, sawing, demolishing, crushing, drilling, coring, grinding, jackhammering, or sanding. It can also become respirable when mixing crystalline silica-containing materials and when performing clean-up on construction sites.

The action level for respirable crystalline silica is $25 \mu\text{g}/\text{m}^3$, calculated as an 8-hour time-weighted average (“TWA”). The permissible exposure limit (“PEL”) is $50 \mu\text{g}/\text{m}^3$ as an 8-hour TWA. Utilizing proper housekeeping, engineering controls, and work practices, reduces the amount of crystalline silica that becomes airborne. Lastly, using respiratory protection can protect employees from inhaling respirable crystalline silica.

1.1 Purpose

The purpose of this written plan is to provide guidance to supervisors and employees on identifying tasks involving crystalline silica and the methods used to protect employees. The written plan will assist in safeguarding health through proper selection of engineering and workplace controls and wearing personal protective equipment (i.e., a respirator). This written plan meets the requirements of California Code of Regulations, Title 8, Sections 1523.3 (Construction) and 5204 (General Industry).

1.2 Scope

The Respirable Crystalline Silica Exposure Control Plan applies to all University employees who may, in the course of their employment, be exposed to respirable crystalline silica at or above the action level or perform construction-related tasks which are identified in Table 1 of this plan. Employees are required to follow the guidelines and procedures set-forth in this manual. Employees should read this manual carefully and questions regarding the contents of this manual should be brought to the attention of their immediate supervisor.

1.3 Competent Person

The regulation requires a “Competent Person” be assigned. The competent person is defined as “an individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them.” The competent person at the University is the Director of Environmental Health and Safety or their designee. In addition, supervisors who have the appropriate training may act as competent persons.

2.0

RESPONSIBILITIES

2.1 Environmental Health and Safety

- Develop, implement, review, and update the Respirable Crystalline Silica Exposure Control Plan.
- Send written plan to supervisors of affected employees when plan is updated.
- Ensure the written plan is made available to all employees by posting to EHS webpage.
- Work in conjunction with supervisors to identify employees or groups of employees who will need training.
- Conduct fit tests and administer training for employee's who utilize respiratory protective equipment.
- Conduct and maintain records for exposure assessments.
- When applicable, coordinate the medical surveillance of silica workers.
- Coordinate HEPA-vacuum filter efficiency testing.

2.2 Supervisors

- Notify direct reports of changes to written plan.
- Notify EHS of employees who need training and ensure assigned training is completed by direct reports.
- Identify those employees that may need respiratory protective equipment and notify EHS to schedule a fit test.
- Notify EHS if there are any changes to work environments that may present new exposures to respirable crystalline silica.
- Make frequent and regular inspections of job sites, materials, and equipment
- Ensure proper engineering, work practice, and housekeeping controls are adhered to. Ensure employees are wearing respirator when required per Table 1 of this plan.
- Purchase respirators, filters, cartridges, respirator cleaning supplies and engineering controls required for tools listed in Table 1.

2.3 Employees

- Complete assigned training.
- Understand the applicable components and adhere to all the rules and requirements of the Respirable Crystalline Silica Exposure Control Plan.
- Utilize the issued respirator in accordance with instructions and training provided. Ensure proper respiratory maintenance such as storage, cleaning and disinfecting.
- Notify supervisor if there are any changes to health that may prevent respiratory protector's effectiveness.
- Report any exposure, accident, or injury to their supervisor.

3.0

EXPOSURE CONTROL METHODS

Cal/OSHA has published a list of typical equipment and tasks involved in disturbing crystalline silica-containing materials. This plan only discusses activities that take place at Chico State. For a full list of tasks, reference the regulatory standard. For each task identified in Table 1 below, the engineering controls, work practice controls, and respiratory protection (collectively known as exposure control methods) specified for that task must be fully and properly implemented. Exposure monitoring will not be required if all exposure control methods listed in Table 1 are implemented.

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"> 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
2a	Handheld power saws (any blade diameter) when used outdoors	<ul style="list-style-type: none"> 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	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"> 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. 	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"> 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
4a	Walk-behind saws when used outdoors	<ul style="list-style-type: none"> 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

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
4b	Walk-behind saws when used indoors or in an enclosed area	<ul style="list-style-type: none"> 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. 	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
5	Handheld and stand-mounted drills (including impact and rotary hammer drills)	<ul style="list-style-type: none"> Use drill equipped with commercially available shroud or cowl 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
6a	Jackhammers and handheld powered chipping tools when used outdoors	<ul style="list-style-type: none"> Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact. <p>OR:</p> <ul style="list-style-type: none"> 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. 	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
6b	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	<ul style="list-style-type: none"> Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact. <p>OR:</p> <ul style="list-style-type: none"> 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. 	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
7	Handheld grinders for mortar removal (i.e., tuck-pointing)	<ul style="list-style-type: 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. 	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	Powered Air-Purifying Respirator (PAPR) with P100 Filters
8a	Handheld grinders for uses other than mortar removal for tasks performed outdoors only	<ul style="list-style-type: none"> 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. OR: <ul style="list-style-type: 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. 	None	None
8b	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	<ul style="list-style-type: 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. 	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
9	Walk-behind milling machines and floor grinders	<ul style="list-style-type: none"> Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR: <ul style="list-style-type: none"> 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

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
10	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"> Apply water and/or dust suppressants as necessary to minimize dust emissions. OR: <ul style="list-style-type: none"> When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab. 	None	None

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

When an employee performs more than one task listed in Table 1 during the course of a shift, and the total duration of all tasks combines 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.

When implementing the exposure control methods listed in Table 1, the following must be followed:

- For tasks performed indoors or in enclosed closed areas, a means of exhaust must be used, as needed, to minimize the accumulation of visible airborne dust.
- For tasks performed using wet methods, water must be applied at flow rates sufficient enough to minimize release of visible dust.

When respiratory protection is required to be worn, all requirements of Title 8, Section 5144 and the University’s Respiratory Protection Program must be adhered to.

4.0 **ALTERNATIVE EXPOSURE CONTROL METHODS**

4.1 Exposure Assessments

For tasks not listed in Table 1, or where the University is unable to fully and properly implement the engineering control, work practices, and respiratory protection described in Table 1, exposure assessments will be performed for those employees who are or may be reasonably expected to be exposed to respirable crystalline silica at or above the action level. This will be done by either a performance option or a schedule monitoring option as defined below. Environmental Health and Safety will be making the determinations for the performance option and performing the exposure monitoring for the scheduled monitoring option.

- Performance Option - Assessing the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to respirable crystalline silica.
- Scheduled Monitoring Option - Performing exposure monitoring, on a predefined schedule, for each employee or group of employees (if jobs duties are similar) with personal breathing zone air samples to determine exposure to respirable crystalline silica.

Employees have the right to observe any monitoring of exposure to respirable crystalline silica. Within five working days after completing exposure monitoring, EHS will notify the affected employee(s) in writing the results of that assessment. Whenever an exposure assessment indicates employee exposure is above the PEL, the University will describe in the written notification the corrective action taken to reduce exposure to or below the PEL (more information provided in Section 4.2).

The University will reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices will be expected to result in new or additional exposures at or above the action level.

4.2 Methods of Compliance

If it is found an employee or group of employees are exposed to respirable crystalline silica above the PEL, engineering and work practice controls will be utilized to reduce and maintain employee exposure to respirable crystalline silica to or below the PEL. Wherever engineering and work practice controls are not feasible or when they cannot lower employee exposure to or below the PEL, the University will provide respirators to supplement the engineering and work practice controls.

5.0

HOUSEKEEPING

Proper housekeeping is required when cleaning up areas after performing construction tasks on crystalline silica-containing materials. The following housekeeping items must be followed:

- Dry sweeping or brushing is not allowed where such an 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.
- Compressed air is not allowed 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 other alternative method is feasible.

6.0

MEDICAL SURVEILLANCE

Medical surveillance will be made available, at no cost to employees and at a reasonable time and place, for each employee who will be required under the regulation to use a respirator for 30 or more days per year (“covered employee”). There are no known employees that meet this definition. Regardless, this section reviews medical surveillance requirements.

All medical examinations will be performed by a physician or licensed health care provider (“PLHCP”). The following information will be provided to the PLHCP:

- 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 to be used by the employee, including when and for how long the employee will use that equipment; and
- Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the University.

A written medical opinion will be submitted to the University and the employee. It will include the following information only:

- The date of the examination,
- A statement that the examination has met the requirements of the standard, and
- Any recommended limitations on the employee’s use of a respirator.

A more in-depth written report with confidential medical information will be made available to the employee by the PLHCP.

6.1 Initial Examination

An initial medical examination will be made available to covered employees within 30-days after initial assignment. The examination will consist of the following:

- 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; history of tuberculosis, and smoking status and history;
- A physical examination with special emphasis on the respiratory system;
- A chest x-ray;
- A pulmonary function test;
- Testing for latent tuberculosis infection; and
- And other tests deemed appropriate by the PLHCP.

6.2 Periodic Examinations

A periodic examination will occur every three (3) years, or more frequently if recommended by the PLHCP. The examination will include procedure described in Section 6.1 of this plan, except for latent tuberculosis infection testing.

6.3 Additional Examinations

If the PLHCP's written medical opinion indicates that an employee should be examined by a specialist, the University will make available a medical examination by a specialist within 30-days after receiving the PLHCP's written opinion.

7.0 HAZARD COMMUNICATION AND TRAINING

7.1 Hazard Communication

Communication of the hazards associated with respirable crystalline silica will comply with the hazard communication standard (CCR Title 8, Section 5194) and the University's Hazard Communication Program Plan.

7.2 Signs for Regulated Areas

Regulated areas must be established where respirable crystalline silica exposures at a fixed location are known to be at or above the PEL. There are no known regulated areas for respirable crystalline silica on campus.

7.3 Training

Training and education programs are administered to employees through the CSU Learn system. Where possible, groups of employees will be auto-assigned training based on job positions; if jobs vary, individuals will be assigned. Training will be provided, at no cost to employees, prior to assignment and every three (3) years thereafter. The training will consist of, at a minimum, the following information:

- 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 the employer has implemented to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used;
- The contents of this section;
- The identity of the competent person designated by the employer; and
- The purpose and description of the medical surveillance program.

8.0

RECORDKEEPING

8.1 Exposure Assessments

The University will maintain all exposure measurements (air monitoring) taken, or objective data used, to assess employee exposure to respirable crystalline silica in accordance with CCR Title 8 Section 3204.

8.2 Medical Evaluations

Medical evaluations will be maintained by the University's contracted physician or licensed health care professional in accordance with Title 8, Section 3204.

9.0 PLAN REVIEW AND EFFECTIVENESS

The Respirable Crystalline Silica Exposure Control Plan will be reviewed on an annual basis to ensure it meets regulatory requirements. The Plan will also be evaluated for effectiveness by reviewing silica related complaints and reported concerns.