

Silica Exposure Control Plan

A Crystalline Silica Exposure Control Plan is designed to prevent health effects from respirable crystalline silica exposures. This plan follows the requirements of both the OSHA General Industry Rule (29 CFR 1910.1053) and the OSHA Construction Rule (29 CFR 1926.1153) as employees may be involved in activities that are covered under either rule relative to potential crystalline silica exposures.

The requirements in this plan apply to all **[Company Name]** employees who are exposed to respirable crystalline silica at or above the action level or permissible exposure limit or perform construction-related tasks which are identified in Table 1 of the standard.

This written exposure control plan will be readily available for examination and copying, upon request, to each employee covered by this section, their designated representatives. This plan will be reviewed and evaluated for effectiveness at least annually and updated as needed.

Introduction

Silica is the compound formed from the elements silicon (Si) and oxygen (O) and has a molecular form of SiO₂. Silica is the second most common mineral on earth, found in the common form as “sand” and “rock.” The three main forms or ‘polymorphs’ of silica are alpha quartz, cristobalite, and tridymite. The polymer most abundant and most hazardous to human health is alpha quartz and is commonly referred to as crystalline silica. Crystalline silica is a common mineral that is found in materials that we see every day in roads, buildings, and sidewalks. It is a common component of sand, stone, rock, concrete, brick, block, and mortar.

Health Hazards Associated with Silica Exposure

The health hazards of silica come from breathing in the dust. If crystalline silica becomes airborne through industrial activities, exposures to fine crystalline silica dust (specifically exposure to the size fraction that is considered to be respirable) can lead to disabling, sometimes fatal disease called silicosis and other non-malignant respiratory diseases, such as chronic bronchitis, Lung Cancer, kidney disease including nephritis & end-stage renal disease (kidneys) and may be associated with auto-immune disorders & cardiovascular disease.

Responsibilities

Due to the risk posed by respirable silica, personnel involved in activities that could potentially create silica dust take specific actions to ensure that, as much as practicable, a hazard is not created. In recognition of this, the following Silica related responsibilities have been established.

Competent Person -will serve as the silica competent person and be responsible for the implementation of this written control plan.

Management is responsible for:

- Providing program oversight and consultation to employees regarding potential risks, exposure prevention, and training relating to potential crystalline silica dust exposures.
- Implementing a suitable respirable crystalline silica exposure monitoring program, or otherwise ensuring representative exposure monitoring results are available.
- Designating a “competent person” and defining/assigning appropriate responsibilities.
- Ensuring project and/or task specific Exposure Control Plans (ECPs) are developed, communicated, and effectively implemented as appropriate.

- Ensuring that all affected employees and their managers or supervisors receive the necessary training related to this plan, as well as task specific ECPs.
- Maintaining applicable records, i.e. exposure sampling, respirator fit tests, training, etc. in accordance OSHA regulations.
- Notifying the Employee Health Office of any employee/job category that meets any of the criteria for inclusion in this plan.
- Conducting a review of this plan annually and updating it as necessary.
- Conducting medical surveillance in accordance with 1910.1053 and 1926.1153.
- Maintaining records of the physical examinations, x-rays and tests.
- Providing the Employee and Employer with the PHLCP's Written Medical Opinion, as required under the standard.
- Inspecting job sites, materials and equipment on a regular and frequent basis.
- Identifying existing and foreseeable respirable crystalline silica hazards and taking prompt corrective action to minimize or eliminate these hazards.
- Being familiar with the Silica Exposure Control Plan.
- Notifying employees when problems arise, there is a change in engineering controls and work practices, or in situations of uncontrolled releases of visible dust in occupied buildings.
- Providing affected new employees with informal on-the-job training about this plan.
- Making information and training materials available to potentially affected employees.
- Supplying appropriate equipment and personal protective equipment (PPE) to affected employees free-of-charge.
- Requiring affected employees to wear personal protective equipment as outlined in the plan.
- Ensuring that affected employees receive medical surveillance and attend required training.

Employees are responsible for:

- Observing the procedures and requirements outlined in this plan.
- Knowing the hazards of silica dust exposure.
- Reporting immediately to their supervisor, any hazards (i.e. unsafe conditions, unsafe acts, improperly operating equipment, PPE issues/needs etc.).
- Attending training sessions.
- Complying with medical surveillance requirements.
- Wearing respiratory protection, and other PPE, as required.
- Notifying supervisors of changes in the workplace that could cause an increase in exposures to respirable crystalline silica.

Specified Exposure Control Methods

Potential silica-containing substrates and materials encountered at this facility include Examples: brick, cement, concrete, concrete block, drywall, grout, mortar, paints containing silica, plasters, roof tile, and various types of tiles. Activities impacting these materials also vary, including cutting/sawing, demolishing/disturbing, drilling/coring, grinding, jackhammering, milling, mixing/pouring, sanding, scraping, and even clean-up activities such as sweeping and vacuuming.

The tasks that our staff may perform on silica-containing materials that are not represented in the Table 1 list include Examples: scraping of painted drywall and plasters, light demolition activities involving handheld tools and reciprocating saws, mixing and pouring, and cleanup methods. Engineering and work practice controls will be used, employee exposure monitoring will be conducted, and respiratory protection will be employed, as necessary.

If these tasks fall outside the scope of Table 1, *we* will perform an exposure assessment using either the “Performance Option” or the “Scheduled Monitoring Option”, both of which are described below. If these operations exceed the AL or PEL, they will be identified in the plan along with the controls used to ensure employees are protected.

Risk Control

Control Methods: When determining measures to reduce or eliminate worker exposure to silica dust, **[Company Name]** will generally select a combination of controls, listed in order of preference:

- Elimination and Substitution
- Engineering
- Administrative
- Personnel Protection Equipment (PPE)

Substitution and Elimination: Whenever possible, *we* will substitute products containing silica with products that do not contain (or contain a lower percentage of) crystalline silica. When substitution is not feasible, during the planning process, *we* will make efforts to reduce the need and/or duration of activities that produce exposures to respirable silica.

Engineering Controls: Engineering controls are those controls which aim to control or otherwise minimize the release of crystalline silica. Two “common” engineering control options available are Local Exhaust Ventilation (LEV) and Wet Dust Suppression (WDS) systems.

Administrative Controls: Administrative controls are those that aim to control or otherwise minimize the release of silica using work procedure and work methods, rather than by affecting the actual physical work. Common examples of administrative controls include, but are not limited to:

- Rescheduling of work to avoid the activities of others.
- Relocating unprotected workers away from dusty areas.
- Avoid using compressed air to clean and dry sweeping of silica containing material. Wet sweep whenever feasible.

- When administrative controls are used, we will employ the following systems and safe work practices:
- As able, work activities will be scheduled to minimize the silica related effect on, and from, others.
- Suitable housekeeping, restricted work area, hygiene practices, training and supervision procedures/standards will be determined and implemented.

Personal Protective Equipment Controls: When engineering and administrative controls are not effective in reducing exposures below the PEL, use of respiratory protective equipment will be required.

Exposure Limits

Exposure Limits/Considerations: The OSHA silica regulation (1926.1153 Respirable Crystalline Silica) lists a Permissible Exposure Limit (PEL) for respirable crystalline silica (including quartz) of 50 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$) and an Action Level of 25 $\mu\text{g}/\text{m}^3$. This is a concentration to which nearly all workers could be exposed for eight hours a day, five days a week, without adverse health effects.

Exposure Assessment

Management will assess the exposure of each employee who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level in accordance with either the performance option or the scheduled monitoring option.

Performance Option

Management will assess 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

We will perform initial monitoring to assess the 8-hour TWA exposure for each employee on the basis of one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification, in each work area. Where several employees perform the same tasks on the same shift and in the same work area, the employer may sample a representative fraction of these employees in order to meet this requirement. In representative sampling, the employer shall sample the employee(s) who are expected to have the highest exposure to respirable crystalline silica.

- If initial monitoring indicates that employee exposures are below the action level, the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring.
- Where the most recent exposure monitoring indicates that employee exposures are at or above the action level but at or below the PEL, the employer shall repeat such monitoring within six months of the most recent monitoring.
- Where the most recent exposure monitoring indicates that employee exposures are above the PEL, the employer shall repeat such monitoring within three months of the most recent monitoring.

- Where the most recent (non-initial) exposure monitoring indicates that employee exposures are below the action level, the employer shall repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken 7 or more days apart, are below the action level, at which time the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring.

Housekeeping

- Dry sweeping or dry brushing of dust containing respirable crystalline silica is prohibited. Use of a HEPA filtered vacuum cleaner, followed by wet mopping, or wet sweeping as necessary. Wet sweeping compounds can be an acceptable dust suppression housekeeping method provided that the compounds are non-grit, oil, or wax based. If HEPA vacuuming or wet mopping/sweeping is not feasible because doing so may cause damage to equipment or create a greater hazard, then management or competent person must be contacted to discuss alternative cleaning methods.
- Do not use compressed air to clean an employee's clothes that have become soiled with dust containing respirable crystalline silica or use compressed air to clean skin and clothing at any time. A HEPA filtered vacuum should be used to remove dust followed by laundering. Coveralls can be used to minimize the transfer of dust to other areas such as an office, break room, vehicle, or home environment. Vacuum the coveralls with a HEPA filtered vacuum before removing them to launder or, if disposable, place in the normal trash. Vacuum filters can also be placed in the normal trash.

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. 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.

Respiratory Protection

Respiratory protection is required during certain activities identified in Table 1 of this plan. It may also be required if other tasks are identified where employee exposures exceed the PEL and work practice or engineering controls are not feasible or effective enough to reduce exposures. All respirator use will comply with MIOSHA Part 451. Respiratory Protection standard and Respiratory Protection Program.

The following table provides recommended respiratory protection levels based on the measured or anticipated exposure levels:

Respirator	Protection Factor	Typical Silica Activity
N95	Less than 50 µg/m ³	- Used on voluntary basis to control low exposures
Half-face with HEPA filters	50 – 500 µg/m ³	- Housekeeping (wet method) - Saw cutting (wet method) - Drilling (wet method) - Power tools with dust collection
Full-face with HEPA filters	500 – 5,000 µg/m ³	- Mixing grout in bulk - Vacuum abrasive blasting
SCBA / CABA	Above 5,000 µg/m ³	- Abrasive Blasting

Medical Surveillance

Medical surveillance will be required for any employee who meets any of the following criteria:

- Exposure to respirable crystalline silica is above the permissible exposure limit.
- Exposure to respirable crystalline silica at/above the action level for 30 or more days per year.
- Required to wear a respirator for 30 or more days a year (per Table 1).
- Work with crystalline silica and develop signs/symptoms of excessive exposure to respirable crystalline silica.

Training

Training is required upon initial assignment to a job where silica-containing materials will be impacted and may result in exposures above the AL or where tasks in Table 1 are performed.

This training will cover the following topics:

- Health hazards associated with respirable crystalline silica,
- Specific tasks in the workplace could result in exposure to respirable crystalline silica,
- Specific measures the employer has implemented to protect employees from exposure, including engineering and work practice controls as well as respiratory protection,
- The contents and availability of the Construction and General Industry OSHA Silica Standards, as applicable,
- The identity of the competent person (for the construction related activities),
- The purpose and description of the medical surveillance program.

Record Keeping

We will maintain employee exposure information for at least 30 years. Medical Surveillance records will be kept by the management for the duration of the employee's employment, plus 30 years.

Education and Training

Prior to performing activities or working on project sites where personnel could be exposed to silica dust, we will ensure that personnel receive suitable education and training. While not necessarily an exhaustive list, education and training may include:

- The health hazards and risks associated with exposure to silica dust.
- The specific tasks that could result in silica exposure.
- General and specific silica exposure reduction methods/strategies (i.e. as detailed in the general/specific exposure control plans).
- The use of specific pieces of equipment and control systems (i.e. LEV and WDS systems).
- The use and care of respiratory (and other) personal protective equipment.
- The general provisions of the OSHA silica standard.
- The employee identified as the competent person for the Silica Exposure Control Plan.

The education and training detailed will be delivered to employees through a variety of forums, including but not necessarily limited to:

- New Employee Orientations.
- Project/Site Orientations.
- Equipment/task specific training.
- Start of shift “Pre-Task Planning”.
- Toolbox Talks

COMPANY-SPECIFIC AND TASK-SPECIFIC EXPOSURES AND CONTROLS

Location	Task	Control Methods	Personal Protective Equipment	Work Practices/Comments