Respirable Crystalline Silica Dust

Contents

1. What is respirable crystalline silica dust?

Crystalline silica is a very common mineral and comes in three types – quartz, cristobalite, and tridymite. It's most prevalent form, quartz, is the main component of sand and is found in sandstone, granite, & limestone. It is found on many construction jobsites and used in many building materials. It literally can be found on about every jobsite in America.

Respirable crystalline silica dust is generated by the breaking-up of silica-containing materials. This occurs during any high energy work task/activity capable of producing airborne dust particles. Those particles that are capable of being inhaled deep into the lungs – at least 100x smaller than a grain of sand – are referred to as the "respirable" portion of the dust. This is the part that is hazardous.

Repeated overexposures to respirable crystalline silica can cause serious health issues, which may include cancer, silicosis, lung effects, immune system effects, and kidney effects.

Common silica-containing materials

- Concrete, grout, cement & mortar
- Block/CMU, brick & precast
- Asphalt
- Terrazzo
- Tile (clay & ceramic)
- Limestone, granite, sandstone
- Some drywall & joint compounds
- Plaster
- Some paint products
- Some welding electrodes

Activities that can create RCS dust

- Cutting
- Grinding
- Chipping
- Crushing
- Abrasive blasting
- Sawing
- Drilling
- Sanding
- Jackhammering

2. Scope & application.

The provisions of this policy apply to all workplace respirable crystalline silica dust exposures that may equal or exceed an 8-hr. time-weighted average (TWA) of 25 micrograms per cubic meter (25 µg/m^3) – **whether ours or a subcontractor's.**

Exclusion – This policy (& OSHA's construction silica standard) ***does not apply to*** the following activities:

- Mixing mortar;
- Pouring concrete footers, slab foundation, and foundation walls;
- Removing concrete formwork;
- Less than 15 min. of work (for day) involving incidental respirable crystalline silica dust exposure (ex: drilling holes)
- Any other works where exposures will remain low under any foreseeable conditions (less than 25 µg/m^3).

3. Competent person.

A competent person is a person who is experienced and safety trained with respect to a particular topic. This person also has authority to take necessary actions to correct or prevent hazards.

On our jobsites, the foreman shall be designated as the competent person responsible for ensuring that the on-site provisions of this policy are completely implemented. This shall include, but may not be limited to:

- Identifying our sources of silica dust exposures & pre-planning necessary control measures;
- Clearly communicating dust control expectations to affected employees & subcontractors;
- Ensuring measures are in place to limit respirable crystalline silica dust exposure to others on site; and
- Inspecting RCS dust control & housekeeping measures as part of regular daily safety inspections.

4. Workplace respirable crystalline silica dust exposures & required control measures.

The following table documents work tasks that could create an employee respirable crystalline silica dust exposure. Dust control measures and respiratory protection expectations are included:

WORK TASK	CONTROL MEASURE[1,2]	DUST MASK REQ'D?	PROT. OTHERS? (Sect. 7)
a) Handheld power saws *(any blade dia.)*	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.*	**OUTSIDE** if +4 hrs. **INSIDE** YES	YES
	Saw equipped with integrated HEPA-filtered dust collection system. This option only permissible if wet methods are infeasible (freezing temperature) or create a serious hazard (electrocution).	YES	YES
b) Walk-behind saws	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.*	**OUTSIDE** NO **INSIDE** YES	NO YES
c) Drivable saws	**FOR OUTDOORS ONLY** 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.*	NO	NO
d) Rig-mounted core saws or drills	Tool equipped with integrated water delivery system that continuously feeds water to cutting surface. • *Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.*	NO	NO
e) Handheld & stand-mounted drills *(including impact, core & rotary hammer drills)*	Drill equipped with commercially available shroud or cowling with dust collection system. HEPA-filtered vacuum when cleaning holes. • *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 mfr., or greater, and have a filter with 99% or greater efficiency, and a filter cleaning mechanism.*	NO	NO
f) 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. **- OR -**	**OUTSIDE** if +4 hrs.	YES

	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*	**INSIDE** YES	YES
g) Handheld grinders for mortar removal *(i.e., tuckpointing)*	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.*	YES *(PAPR air-fed helmet if +4 hrs.)*	YES
h) Handheld grinders for uses other than mortar removal	**FOR 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.* **- OR –** **FOR OUTDOORS OR INDOORS** 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.*	NO **OUTSIDE** NO **INSIDE** If +4 hrs.	NO NO YES *(if +4 hrs.)*
i) 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 accordance with manufacturer's instructions to minimize dust emissions.* **- OR –** 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.	NO	NO
j) 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*	NO	NO

k) 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.* **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 -** 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.*	NO	NO
l) 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-controlled station.	NO	NO
m) 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 employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	NO	NO
n) 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 -** When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	NO	NO

[1] Each employee is responsible for inspecting the dust control measure prior to start of work task, and throughout, to confirm it is in proper working order and is effectively controlling dust exposures. If visible dust emissions increase, then work must stop to ensure that the dust control measure is functioning properly.

[2] For tools/equipment that employ HEPA-filtered vacuums, the filter cleaning mechanism must be activated at a frequency specified by the manufacturer.

5. Respirator/dust mask use.

Any individual required to wear a respirator (which includes a dust mask) must receive a medical evaluation, annual respirator training, and annual fit testing. These provisions – and others pertinent to respirator use – are set forth in our written Respiratory Protection Program.

6. Exposure sampling.

6.1. When is sampling needed? – Work tasks and related dust control measures that are not identified in section 4 of this policy (which is from Table 1 of OSHA's Respirable Crystalline Silica standard – 29 CFR 1926.1153) will require personal exposure sampling to determine employee exposure level. Any sampling conducted must be representative of the work task being evaluated and account for a worst-case exposure scenario.

Results of any sampling conducted will be provided in **Appendix A**.

6.2. Frequency – When sampling is required, frequency of repeat sampling shall depend on results as follows:

SAMPLING RESULTS	SAMPLING FREQUENCY / NEXT DUE
Less than 25 µg/m^3	No need to repeat sampling (assuming conditions do not change).
Between 25 – 50 µg/m^3	Repeat sampling every 6 months.
Over 50 µg/m^3	Repeat sampling every 3 months.

Also, repeat sampling if any changes have been instituted that could affect employee exposures. (For example, following any notable change in equipment, work task procedure, airborne silica content, etc.)

7. Housekeeping practices.

7.1. Acceptable methods – Only the following methods may be used to clean-up respirable crystalline silica dust on work surfaces and equipment. RCS dust may be expected any time processes that involve high-speed equipment are being used on a silica containing material. *(See section 1 for examples.)*

- Wet methods
- Use of sweeping compound *(non-grit/oil-based/wax-based – use according to manufacturer directions)*
- HEPA-filtered vacuum – *When emptying vacuum, carefully discard dust in a manner that does not create a dust cloud. Close any collection bags before discarding into trash receptacle/dumpster.*

These practices do not need to be used when cleaning ordinary soil, large debris, and/or non-silica-containing materials.

7.2. Prohibited methods – The following practices are not permitted when cleaning-up silica-containing dust:

- Dry sweeping without sweeping compound
- Dry brushing
- Use of compressed air
- Any other practice that creates airborne dust clouds.

The use of compressed air is not permitted for the cleaning of surfaces or clothing, unless a ventilation system effectively captures the dust cloud.

8. Practices to limit exposure to others on site.

The practices outlined in this section shall be instituted to protect others on site any time dust masks must be worn (per section 4 table – see last 2 columns), or any time a work task/activity is not identified in section 4 (unless sampling data has been provided to us, showing exposure levels to be below 50 µg/m^3).

When so required, any of the following work area controls shall be instituted IN ADDITION TO THE CONTROL MEASURES OUTLINED IN SECTION 4.

8.1. Work scheduling – To the extent feasible, schedule the work so that only we have necessary personnel in the area during the time needed to complete the task. Can it be done before or after regular workday hours?

8.2. Restrict access – To the extent necessary & feasible, restrict access to the area in which our RCS dust-producing work is taking place. Take the following steps:

- Notify others nearby that your work area will be off limits for ## min/hrs. due to silica dust producing work.
- If necessary, use caution tape, barricades, or cones to restrict entry points & post DO NOT ENTER signs.
- Conduct work, using dust control measures.
- Clean-up using housekeeping practices outlined in section 7.1 of this policy.
- Re-open access to the area.

8.3. Respiratory protection – No other persons are permitted in our work area unless they also are wearing an appropriate respirator in accordance with their Respiratory Protection Program.

9. Voluntary medical surveillance program.

Any individual that is required to wear a respirator for 30 or more days per year for purposes of protection against respirable crystalline silica dust shall be offered medical surveillance, with examinations and procedures performed by a physician or licensed healthcare provider (PLHCP).

The purpose of this voluntary program is to: 1) Identify respirable crystalline silica-related diseases early so that employees can take actions to protect their health; 2) Determine if an employee has any condition that might make him/her more sensitive to RCS exposure; and 3) Determine the employee's continued fitness to use respirators.

9.1. Counting days – Any day that an individual must wear a respirator is counted as one day, regardless of how long the respirator is worn.

9.2. When it must be offered – The offer for medical surveillance must be made within 30 days of initial assignment to job that will require employee to wear a respirator 30 or more days/year.

9.3. Costs – If an employee opts into medical surveillance, it will be provided at no cost to him/her, and at a reasonable time and place.

9.4. Frequency – If an employee opts into medical surveillance, he/she shall be offered a medical exam every three (3) years, unless the PLHCP recommends more frequently.

9.5. Written medical opinion – Employee shall receive a dated copy of the PLHCP written medical opinion.

9.6. Exam scope – The medical surveillance exam will include a discussion of medical/work history; a physical exam focusing on respiratory system; a chest x-ray; a lung function (spirometry) test; and tuberculosis test, as well as any other test deemed appropriate or necessary by the PLHCP.

10. Multi-employer silica exposures.

If another employer on the jobsite is creating respirable crystalline silica dust to which our personnel become exposed, immediately report the issue to your foreman. He/she shall attempt to address the issue directly with the creating contractor(s).

If corrective action is not immediately taken, the foreman shall attempt to remedy the issue through the site general contractor AND shall notify our project manager. If corrective action still is not taken, project management shall become involved.

If necessary, our personnel will be removed from the affected area(s) and/or possibly the jobsite until the matter is resolved.

11. Subcontractors.

The following provisions apply to our subcontractors who generate respirable crystalline silica dust on our jobsites:

11.1. Pre-plan meeting – On or before the subcontractor's first day on our job, the foreman shall meet with subcontractor to discuss their work activities that may produce respirable crystalline silica AND what control measures will be put in place.

11.2. Competent person – The competent person responsible for fully implementing their respirable crystalline silica dust policy shall be made known to our foreman. That person shall be responsible for ensuring compliance with the new OSHA respirable crystalline silica standard.

11.3. Written policy – Subcontractor shall maintain a copy of their written Respirable Crystalline Silica Exposure Control Plan on site. This plan must contain the following OSHA-required topics at a minimum:

- ID tasks that present respirable crystalline silica exposure
- ID devices (engineering controls), work practices, & PPE necessary to control exposures below OSHA limits
- Describe housekeeping measures to be employed
- Describe procedures to be employed to restrict respirable crystalline silica exposure to others in work area(s)
- Employee training on hazards of respirable crystalline silica dust & contents of your written plan
- Annual plan review
- Designate competent person on site to implement plan (including regular inspections)

11.4. Dust control methods – The methods used to control respirable crystalline silica dust shall be those specified in Table 1 of OSHA's respirable crystalline silica standard (referenced in section 4 of this policy).

Where a subcontractor work task is not identified in the table, or is not conducted in accordance with dust control measures identified in the table, we will first require a copy of their personal exposure sampling results. This information shall be forwarded to project management for review and a site-specific game plan will be established before work may proceed.

11.5. Respirators/dust masks – Respirators/dust masks are not to be used as the sole means of dust exposure control. When required to supplement dust collection or wet method controls, it is expected that the subcontractor employee(s) wear the respirator/dust properly. NOTE: Dust masks are considered to be respirators.

In accordance with OSHA requirements, subcontractors are expected to have a written Respiratory Protection Program, conduct medical evaluations for all wearers, conduct annual fit testing for all wearers, and annual training for all wearers. Typically, we will assume that the subcontractor has complied with these requirements. However, please report any serious or recurring issues to project management so that a process of policy and training verification can be initiated with the offending sub.

12. Employee training.

All employees who may be exposed to respirable crystalline silica dust must receive initial training. This training does not need to be repeated with any specific frequency, however we will endeavor to schedule refresher training every 3 – 5 years.

Respirable crystalline silica dust training shall cover the following topics, and be administered by a person who is knowledgeable of the subject matter covered by this policy.

- Health hazards of respirable crystalline silica dust exposure
- Workplace exposures
- Expected exposure control measures
- Overview of OSHA's Respirable Crystalline Silica standard
- Identity of competent person(s) assigned duties in this plan
- Purpose & description of the voluntary medical surveillance program

13. Recordkeeping.

The follow records shall be maintained as indicated:

Record	Record Contents	Duration
13.1. Air monitoring data	These records must include: • *Date of measurement for each sample* • *Task monitored* • *Sampling & analytical methods used* • *Number, duration, & results of samples taken* • *Identity of lab that performed the analysis* • *Type of PPE, such as respirator, worn by employee(s) monitored* • *Name, social security number, & job classification of all employees represented by the monitoring, indicating which employee(s) were actually monitored*	Min. 30 years

13.2. Objective data	These records must include: *i. Crystalline silica-containing materials in question* *ii. Source of the objective data* *iii. Testing protocol & results of testing* *iv. Description of process, task, or activity on which the objective data were based; and* *v. Other data relevant to the process, task, activity, material, or exposures on which the objective data were based*	Until replaced with newer data
13.3. Medical surveillance records *(biological monitoring and medical examination results)*	These records must include: *i. Employee name & social security number* *ii. Copy of PLHCP's & specialist's written medical opinion* *iii. Copy of the information provided to the PLHCP & specialist* EXCEPTION – Employees who worked less than one (1) year. No need to retain beyond employment if provided to employee upon termination.	Duration of employment PLUS 30 years
13.4. Training documentation	For each training session, the following information shall be documented: *i. Date(s) of training sessions* *ii. Attendee sign-in sheet* *iii. Training content summary* *iv. Signature of person(s) conducting the training*	Min. 10 years

14. Annual plan review.

Per OSHA requirements, a full review of this policy will be conducted every twelve (12) months. **Appendix B** will be used for this purpose. The completed Appendix B form is to remain a part of this policy until replaced by the next year's review.

Use the review to accomplish the following:

14.1. Address problems, concerns, or unsafe situations that have arisen since last review;
14.2. Evaluate the effectiveness of prior improvement actions; and
14.3. Assess the opportunity for policy improvement through procedure, equipment, and/or training enhancements

If notable changes are made to this policy, then update training shall be provided to all affected personnel.

Appendix A – Respirable Crystalline Silica Dust Sampling Results

WORK TASK & CONTROL MEASURE	SAMPLE DATE	RESULTS
a)		
b)		
c)		
d)		
e)		
f)		
g)		
h)		
i)		
j)		

Appendix B – Annual Policy Review

Name of competent person completing review:_____ Date:_____

REVIEW PREP

- ☐ Review this written policy.
- ☐ Interview field personnel to solicit comments on policy effectiveness & opportunities for improvement.
- ☐ Review equipment condition & effectiveness.

POLICY EVALUATION

Y N Is all the information in this written policy up-to-date? Is anything new, missing, or obsolete?

_____
_____
_____

Y N Since last review, have there been any problems, concerns, or unsafe situations relating to this policy?

_____
_____
_____

Y N Were there any improvement actions taken as a result of last policy review? If so, describe any unanticipated issues.

_____
_____
_____

Y N As a result of this review, are there opportunities to improve this policy through procedure, equipment, and/or training enhancements? If so, please describe.

_____
_____
_____

OTHER COMMENTS *(use back if needed)*

ACTION ITEMS