

Administrative Procedure, Level 1 - Company Wide

CPCC-PRO-SH-55078

Respirable Crystalline Silica Exposure Control

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Change Summary

Description of Change

This procedure will provide direction for controlling exposure to respirable crystalline silica in accordance with Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1153 and 1910.1053.

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1.0 PURPOSE

This procedure provides a process for controlling exposure to respirable crystalline silica (RCS) in accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1153, Respirable Crystalline Silica (Construction) and OSHA 29 CFR 1910.1053, Respirable Crystalline Silica (General Industry).

NOTE: *Most CPCCo-directed tasks that generate RCS are indistinguishable from construction tasks listed in Table 1, paragraph (c) of 29 CFR 1926.1153. Requirements specific to the general industry standard, OSHA 29 CFR 1910.1053, are clearly demarcated in this procedure.*

1.1 Scope

This procedure applies to all CPCCo-directed work activities where employees are exposed to RCS except when exposure is expected to remain below the occupational exposure limit (OEL) (see Section 3.1) as an 8-hour time weighted average (TWA) under any foreseeable conditions.

1.2 Implementation

This procedure is effective upon release.

2.0 RESPONSIBILITIES

2.1 Industrial Hygienist

The Industrial Hygienist (IH) shall:

- Communicate applicable regulatory requirements to line management and the competent person during the work planning process.
- Prepare a written exposure control plan (ECP) for work activities which generate RCS.
- Support the competent person in RCS hazard identification and control implementation.

2.2 Competent Person

The Competent Person shall:

- Conduct RCS hazard identification and implement control activities on a day-to-day basis, from planning through the completion of the work activity.
- Identify existing and predictable RCS hazard(s) and take prompt corrective measures to control the hazard(s).
- Conduct oversight/inspections of RCS work activities.
- Verify that work practices and hazard control measures are performed as designed and as required to control worker exposures to RCS.

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2.3 Subject Matter Expert

The silica program Subject Matter Expert (SME) shall:

- Manage the CPCCo Silica Program.
- Review RCS ECPs annually and ensure compliance with 29 CFR 1926.1153 (Construction) or 29 CFR 1910.1053 (General industry).
- Assist the project/facility IH professional in the preparation of a silica ECP.
- Review regulatory requirements at least annually and update this procedure as necessary.

2.4 Line Management

Line Management is responsible for ensuring:

- All work activities which may result in worker exposures to RCS are identified.
- The project/facility IH participates in the hazard identification process for work activities where silica is used in a work process or where silica containing materials may be present.
- The development of a silica ECP and a silica competent person is designated for work packages that involve disturbing silica containing materials, and processes where silica is being used.
- The silica competent person is authorized to take prompt corrective measures to control silica hazards.
- Compliance with all requirements set by this procedure.
- The requirements of the silica ECPs are adequately implemented during RCS generating work activities.
- Potential silica exposures are adequately documented in the worker's Employee Job Task Analysis (EJTA).

3.0 PROCESS

3.1 Occupational Exposure Limits

CPCCo will apply the most conservative OEL, in accordance with 10 CFR 851, *Worker Safety and Health Program*, to the expected RCS polymorph, see the table below.

Table 1. Occupational Exposure Limits and Regulatory Agencies

Regulatory Agency	Occupational Exposure Limits and Polymorph
ACGIH – Threshold Limit Value (TLV)	8-hour TWA of 25 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) (quartz and cristobalite)
OSHA – Permissible Exposure Limit (PEL)	8-hour TWA of 50 $\mu\text{g}/\text{m}^3$ (quartz, cristobalite, and/or tridymite)
OSHA – Regulatory Action Level (RAL)	8-hour TWA of 25 $\mu\text{g}/\text{m}^3$ (quartz, cristobalite, and/or tridymite)

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3.2 Implementation and Control Methods

Actionee	Step	Action
NOTE:		<i>Objective data means information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica or activity. The date 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 the employer's current operations.</i>
Line Management/IH Professional		<ul style="list-style-type: none"> • <u>IF</u> performing activities with the potential for silica exposure at or above the OEL and implementing control methods specified in the table in Appendix A, <u>THEN</u>; <ul style="list-style-type: none"> ○ DOCUMENT a written silica ECP. • <u>IF</u> performing activities with the potential for silica exposure at or above the OEL and the control methods specified in the table in Appendix A cannot be fully implemented <p>OR;</p> <ul style="list-style-type: none"> • <u>IF</u> performing activities with potential silica exposure at or above the OEL are not specified in the table in Appendix A OR the activities are classified "General Industry" AND employee exposure is expected to be at or above the OEL, <u>THEN</u>; <ul style="list-style-type: none"> ○ GENERATE an exposure assessment with objective data according to Section 3.4 of this procedure. <ul style="list-style-type: none"> ▪ <u>IF</u> objective data is not available, <u>THEN</u> sampling shall be conducted to ensure employees' exposure remains below the OEL. ○ DOCUMENT a written silica ECP.

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3.3 Silica Exposure Control Plan

Actionee	Step	Action
NOTE:		<i>The term “Exposure Control Plan (ECP)” is synonymous with “Compliance Plan” as used by OSHA in the standards for cadmium, inorganic arsenic, and lead. The term ECP is used throughout this document to better align with the language used in the OSHA Silica Standards. Industrial Hygiene Exposure Assessments (A-6007-296) or Industrial Hygiene Work Permits (A-6007-313) completed with the requirements listed in this section contain the required content for an ECP.</i>

IH Professional/
Designated
Competent
Person

- ENSURE the ECP contains at least the following elements:
 - A description of the tasks in the workplace that involve exposure to RCS;
 - A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to RCS for each task;
 - A description of the housekeeping measures used to limit employee exposure to RCS;
 - Identity of the designated competent person; and
 - A written description used to restrict access to work areas, when necessary, to minimize the number of employees exposed to RCS and their level of exposure, including exposures generated by other employers or sole proprietors.

NOTE: *Exposure control plans are valid for up to one year.*

- ENSURE the ECP is reviewed and evaluated at least annually AND updated as necessary to reflect current workplace conditions.

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3.4 Exposure Assessment

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
IH Professional	1.	<p>ASSESS the 8-hour TWA exposure of each employee who is or may be expected to be exposed to RCS at or above the OEL.</p> <ul style="list-style-type: none">• ENSURE the initial exposure assessment is established prior to the start of the work.• ENSURE the assessment includes the 8-hour TWA based on any combination of air monitoring data, objective data, or scheduled monitoring to accurately characterize employee's exposure to RCS.• REASSESS exposure assessment whenever there are changes in the production, process, control equipment, personnel, or work practices which may reasonably be expected to result in new or higher exposures.

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3.5 Silica Sampling and Employee Notifications

TE-IHP-18-001, *Evaluating and Reporting Respirable Crystalline Silica (RCS) Results*, identified the issues with RCS evaluation and reporting results when OSHA updated the CFR 29 1926.1153 on September 23, 2017. CPCCo will follow the process below for reporting RCS results.

Actionee	Step	Action
IH Professional	1.	IDENTIFY the anticipated silica polymorph(s) in the exposure assessment.
	2.	ENSURE all samples are analyzed per NIOSH 0600/7500.
	3.	IDENTIFY to the SWIHD administrator the anticipated RCS polymorph(s) and the associated sample plan in SWHID for each sample to be corrected to reflect only the specified polymorph(s).
SWIHD Administrator	4.	CORRECT the RCS results for survey samples to the polymorph(s) identified by the IH.
IH Professional	5.	NOTIFY in writing, according to CPCC-PRO-SH-409, <i>Industrial Hygiene Monitoring, Reporting and Records Management</i> , to each affected employee of the results within: <ul style="list-style-type: none"> – Five days for Construction work activities. – Fifteen days for General Industry work activities.
	6.	<u>IF</u> the results indicate at or greater than the OEL, <u>THEN</u> : <ul style="list-style-type: none"> – FOLLOW steps for exceeding OELs in air samples according to CPCC-PRO-SH-409, <i>Industrial Hygiene Monitoring, Reporting and Records Management</i>. – DOCUMENT corrective action to reduce employee exposure in the notification letter.

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3.6 Engineering Controls and Work Practices

Where an employee performs more than one task on Table 1 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 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.

Actionee	Step	Action
IH Professional/ Line Management		<ul style="list-style-type: none"> • USE engineering and work practice controls to reduce and maintain employee exposure to RCS below the OEL. • APPLY the following controls are implemented when the methods in Appendix A – Table 1, <i>Specified Exposure Control Methods</i>, are incorporated into silica work: <ul style="list-style-type: none"> – For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust; – For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust; – For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth: <ul style="list-style-type: none"> ○ Is maintained as free as practicable from settled dust; ○ Has door seals and closing mechanisms that work properly; ○ Has gaskets and seals that are in good condition and working properly; ○ Is under positive pressure maintained through continuous delivery of fresh air; ○ 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 ○ Has heating and cooling capabilities.

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3.7 Housekeeping and Prohibited Activities

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Competent Person/ employees	1.	IF performing housekeeping activities (e.g., sweeping, dry brushing, etc.) that generate exposure to RCS, <u>THEN</u> ;
		<ul style="list-style-type: none"> ENSURE the use of wet methods, HEPA-filtered vacuuming, or other methods that minimize the likelihood of RCS exposure.
	2.	PROHIBIT the following activities unless controls are provided and documented by the IH Professional and approved by an OS&IH manager:
		<ul style="list-style-type: none"> Use of compressed air used to clean clothing or surfaces; and Abrasive blasting.

3.8 Respiratory Protection

Respirator selection shall be in accordance with DOE-0352, Hanford Site Respiratory Protection Program (HSRPP).

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
IH Professional/ Line Management	1.	Determine the need for Respiratory Protection Equipment (RPE) based on the following:
		<ul style="list-style-type: none"> Where specified by the table in Appendix A. For tasks not listed on the table in Appendix A, or where engineering controls, work practices, and respiratory protection described in Table 1 are not fully implemented based on an exposure assessment. Where exposures exceed the OEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible. During tasks for which CPCCo has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposure to RCS below the OEL. During periods when an employee is in a silica regulated area (general industry).

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3.9 Training

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Line Management	1.	ENSURE workers who are potentially exposed to RCS at or above the OEL complete the following training: <ul style="list-style-type: none"> • Course 200207, <i>Respirable Crystalline Silica Awareness</i>.
	2.	ENSURE workers who are designated as competent persons complete the following training: <ul style="list-style-type: none"> • Course 200208, <i>Respirable Crystalline Silica – Competent Person</i> • Course 600341, <i>Competent Person – Silica</i> (Training Completion Record (TCR), A-6007-626)

3.10 Medical Surveillance

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Line Management	1.	ENROLL employees in a medical surveillance program for silica if they are required to use a respirator for the control of airborne silica exposure for 30 or more days in a year.
	2.	<u>IF</u> enrolling an employee in medical surveillance, <u>THEN</u> answer question 15, “Respirable Crystalline Silica” on their EJTA and select: <ul style="list-style-type: none"> • “Potential exposure hazards and medical required”

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3.11 Regulated Areas and Postings

This section applies only when work activities generate silica exposure in excess of the OEL falls under the scope of the General Industry standard, 10 CFR 1910.1053.

Actionee	Step	Action
IH Professional/ Line Management	1.	<p>ESTABLISH a regulated area wherever an employee's exposure to airborne concentration of RCS is expected to be at or above the OEL. Access to the regulated areas should be limited to:</p> <ul style="list-style-type: none"> • Appropriately trained workers. • Workers authorized and required by work duties to be present in the regulated areas. • Workers exercising the right to observe monitoring.
	2.	<p>DEMARCATÉ regulated areas from the rest of the workplace in a manner that minimizes the number of employees exposed to RCS within the regulated area.</p>
	3.	<p>POST signage in accordance with CPCC-PRO-SH-40445, <i>Tags, Signs & Barriers</i>, at each entrance of demarcation that at least states the following:</p>

DANGER

RESPIRABLE CRYSTALLINE SILICA

MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS

WEAR RESPIRATORY PROTECTION IN

THIS AREA

AUTHORIZED PERSONNEL ONLY

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4.0 FORMS

A-6007-296, *Industrial Hygiene Exposure Assessments*

A-6007-313, *Industrial Hygiene Work Permits*

A-6007-626, *Training Completion Record (TCR) Competent Person - Silica*

5.0 RECORD IDENTIFICATION

None

6.0 SOURCES

6.1 Requirements

10 CFR 851, *Worker Safety and Health Program*

29 CFR 1910.1053, *Respirable Crystalline Silica*

29 CFR 1926.1153, *Respirable Crystalline Silica*

ACGIH, *Threshold Limit Values for Chemical Substances, Physical Agents and Biological Exposure Indices*, 2016

DOE-0352, *Hanford Site Respiratory Protection Program (HSRPP)*

6.2 References

CPCC-PRO-IRM-10588, *Records Management Processes*

CPCC-PRO-SH-409, *Industrial Hygiene Monitoring, Reporting and Records Management*

CPCC-PRO-SH-40445, *Tags, Signs & Barriers*

CPCC-PRO-TQ-249, *Training Records Administration*


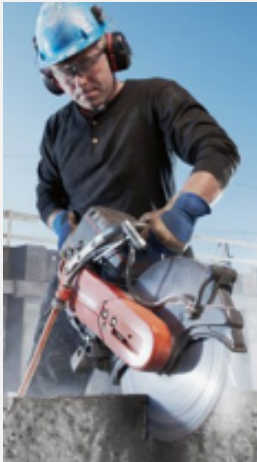
TE-IHP-18-001, *Evaluating and Reporting Respirable Crystalline Silica (RCS) Results*

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Appendix A - Table 1. Specified Exposure Control Methods



Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Stationary masonry saws</p> 	<p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p>	None	None
<p>Handheld power saws (any blade diameter)</p> 	<p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:</p> <ul style="list-style-type: none"> • When used outdoors • When used indoors or in an enclosed area 	<p>None</p> <p>APF 10</p>	<p>APF 10</p> <p>APF 10</p>

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Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)</p> 	<p>For tasks performed outdoors only:</p> <p>Use saw equipped with commercially available dust collection system</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</p> <p>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency</p>	None	None
<p>Walk-behind saws</p> 	<p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:</p> <ul style="list-style-type: none"> • When used outdoors • When used indoors or in an enclosed area 	None APF 10	None APF 10

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Appendix A - Table 1. Specified Exposure Control Methods



Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Drivable saws</p> 	<p>For tasks performed outdoors only:</p> <p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</p>	None	None
<p>Rig-mounted core saws or drills</p> 	<p>Use tool equipped with integrated water delivery system that supplies water to cutting surface</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</p>	None	None

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Appendix A - Table 1. Specified Exposure Control Methods


Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Handheld and stand-mounted drills (including impact and rotary hammer drills)</p> 	<p>Use drill equipped with commercially available shroud or cowling with dust collection system</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</p> <p>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</p> <p>Use a HEPA-filtered vacuum when cleaning holes</p>	None	None
<p>Dowel drilling rigs for concrete</p> 	<p>For tasks performed outdoors only:</p> <p>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</p> <p>Use a HEPA-filtered vacuum when cleaning holes</p>	APF 10	APF 10

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Appendix A - Table 1. Specified Exposure Control Methods


Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Handheld grinders for mortar removal (i.e., tuckpointing)</p> 	<p>Use grinder equipped with commercially available shroud and dust collection system</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</p> <p>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</p>	APF 10	APF 25

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Appendix A - Table 1. Specified Exposure Control Methods

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Small drivable milling machines (less than half-lane)</p> 	<p>Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant</p> <p>Operate and maintain machine to minimize dust emissions</p>	None	None

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Appendix A - Table 1. Specified Exposure Control Methods

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Large drivable milling machines (half-lane and larger)</p> 	<p>For cuts of any depth on asphalt only:</p> <p>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust</p> <p>Operate and maintain machine to minimize dust emissions</p>	None	None
	<p>For cuts of four inches in depth or less on any substrate:</p> <p>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust</p> <p>Operate and maintain machine to minimize dust emissions</p>	None	None
	<p style="text-align: center;">OR</p> <p>Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant</p> <p>Operate and maintain machine to minimize dust emissions</p>	None	None


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Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
<p>Crushing machines</p> 	<p>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)</p> <p>Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions</p> <p>Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station</p>	None	None
<p>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</p> 	<p>Operate equipment from within an enclosed cab</p> <p>When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions</p>	None	None

