

Administrative Procedures

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Respirable Crystalline Silica Exposure Control

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1.0 PURPOSE

This procedure provides direction for controlling exposure to respirable crystalline silica in accordance with Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1153, *Respirable Crystalline Silica*.

NOTE: *Most maintenance tasks performed by HMIS that generate respirable crystalline silica are indistinguishable from construction tasks listed on Table 1 in paragraph (c) of 29 CFR 1926.1153. In addition, the tasks are non-routine and performed in variable environments and conditions. Therefore, 29 CFR 1910.1053 does not apply.*

2.0 SCOPE

This Level 1 Administrative procedure applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below the ACGIH TLV/Occupational Exposure Limit (OEL) of 25 micrograms per cubic meter of air as an 8-hour time weighted average (TWA) under any foreseeable conditions. This procedure applies to Hanford Mission Integration Solutions (HMIS) team employees, HMIS subcontractor employees, and to visitors who may work in environments that may have a potential for exposure to respirable crystalline silica. All silica work performed at HMIS is considered construction activities and therefore this procedure implements the 29 CFR 1926.1153 Respirable Crystalline Silica standard.

3.0 RESPONSIBILITIES

3.1 HMIS Industrial Hygienist (IH)

The industrial hygienist's responsibilities include:

- Working with the designated competent person to complete the Silica Exposure Control Plan (Site Form A-6007-572)
- Communicating applicable regulatory requirements to line management and their competent person during the work planning process
- Preparing a written exposure assessment for respirable silica impacted work
- Supporting the competent person in respirable silica hazard identification and control activities

3.2 Competent Person

The competent person's responsibilities include:

- Conducting respirable silica hazard identification and control activities, on a day-to-day basis, from planning through the completion of the work activity

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- Identifying existing and predictable respirable silica hazard(s), and is authorized to take prompt corrective measures to control the hazard(s)
- Conducting oversight/inspections of respirable silica work activities
- Verifying and documenting determinations that work practices and hazard control measures are performed as designed and as required to control worker exposures to respirable silica.

3.3 Subject Matter Expert (SME)

The Respirable Silica Exposure Subject Matter Expert (SME) responsibilities include:

- Managing the HMIS silica program
- Reviewing respirable silica exposure control plan annually and ensuring compliance with 29 CFR 1926.1153(d)(2), “Exposure Assessment
- Assisting the project/facility safety & health (S&H) professional in the preparation of a silica exposure control plan
- Reviewing regulatory requirements at least annually and updating this procedure as necessary.

3.4 Line Management

Line management’s responsibilities include:

- Identifying all work activities which may result in worker exposures to respirable silica
- Ensuring that 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
- Ensuring the development of a Silica Exposure Assessment and designate a “competent person” for work packages that involve disturbing silica containing materials, and processes where silica is being used
- Authorizing the respirable silica competent person to take prompt corrective measures to control silica hazards
- Ensuring compliance with all requirements set by this procedure
- Ensuring that the requirements of the Silica Exposure Control Plans are adequately implemented during respirable silica work activities
- Ensuring that potential silica exposures are adequately documented in the worker’s “Employee Job Task Analysis” (EJTA)

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4.0 INSTRUCTIONS

4.1 Implementation of OSHA Specified Exposure Control Methods

Actionee	Step #	Action
HMIS team employees, subcontractor employees, visitors	1.	<p>CONDUCT activities with potential silica exposure in accordance with 29 CFR 1926.1153 Table 1 (Appendix A), <i>Specified Exposure Control Methods When working with Materials Containing Crystalline Silica</i>.</p> <ul style="list-style-type: none"> • <u>IF</u> objective data is not available, <u>THEN</u> sampling must be conducted to ensure employees' exposure remains below the OEL of 25 µg/m³ TWA. • <u>IF</u> employee exposure is expected to be at or above the OEL of 25 µg/m³ TWA, <u>THEN</u> a written Exposure Control Plan is required.
	2.	<p><u>IF</u> implementation of controls in Table 1(Appendix A) is not performed and alternate controls are used, <u>THEN</u> ASSESS exposure using the option listed in Section 4.2</p>

4.2 Alternate Exposure Control Methods

4.2.1 Exposure Assessment

Actionee	Step #	Action
IH	1.	<p>ASSESS the 8 hour TWA exposure of each employee who is or may be expected to be exposed to respirable crystalline silica at or above the OEL of 25 µg/m³ TWA.</p> <ul style="list-style-type: none"> • Conduct the exposure assessment before work begins • Reassess exposures whenever a change in production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or higher exposures • Be able to demonstrate that employee exposure have been accurately characterized • Make sure that the exposure assessment reflects the exposures of employees on each shift, for each job classification, in each work area.

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Actionee	Step #	Action
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NOTE: The TWA is based upon air monitoring data or objective data sufficient to characterize employee exposures to respirable crystalline silica.

4.3 Employee Notification of Air Monitoring Results

Actionee	Step #	Action
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- | | | |
|------------|----|---|
| IH | 1. | NOTIFY employees within five days after the completion of an exposure assessment. |
| | 2. | NOTIFY each affected employee in writing of the results of that assessment. |
| Supervisor | 3. | POST the results in appropriate location accessible to all affected employees. |

4.4 Engineering Controls and Work Practices

Actionee	Step #	Action
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- | | | |
|-------------------|----|--|
| IH and Supervisor | 1. | USE Engineering and work practices to reduce and maintain employee exposure to respirable crystalline silica to at or below the OEL, unless a demonstration indicates that such controls are not feasible. |
| | 2. | <u>IF</u> Engineering and work practices are not sufficient to reduce exposure to or below the OEL, then controls
<u>THEN</u> USE them to reduce employee exposure to the lower feasible level and supplement them with the use of appropriate respiratory protection. |

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4.5 Housekeeping Practices

Actionee	Step #	Action
Supervisor	1.	<p><u>WHEN</u> cleaning up dust that could contribute to employee exposure to respirable crystalline silica,</p> <p><u>THEN</u> PROHIBIT the following:</p> <ul style="list-style-type: none"> • Dry brushing or dry sweeping, unless methods such as wet sweeping and HEPA-filtered vacuuming are not feasible; • Cleaning of surfaces or clothing with compressed air.

4.6 Respiratory Protection

Actionee	Step #	Action
IH and Supervisor	1.	<p>DETERMINE the need for respirators based on the following:</p> <ul style="list-style-type: none"> • Where specified by Table 1 • For tasks not listed in table 1, or where engineering controls, work practices, and respiratory protection described in Table 1 are not fully and-implemented based on an exposure evaluation.. • Where exposures exceed the OEL during periods necessary to install or implement feasible engineering and work practice controls • Where exposures exceed the OEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible: and • During tasks for which HMIS has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposure to or below the OEL.

NOTE: *Respirator selection is in accordance with DOE-0352, Hanford Site Respiratory Protection Program (HSRPP).*

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4.7 Written Exposure Control Plan

The written exposure control plan shall include:

- A description of the tasks in the work place that involve exposure to respirable crystalline silica
- A description for the engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task
- A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica
- A description of the procedures used to restrict access to work areas when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposures generated by other employers or sole proprietors

Actionee	Step #	Action
IH	1.	<u>WHEN</u> employee exposure on a construction project is expected to be at or above the OEL, <u>THEN</u> ESTABLISH a written Exposure Control Plan (ECP) by completing form (A-6007-572)
Supervisor	2.	DESIGNATE a competent person (form A-6007-573) who is capable of: <ul style="list-style-type: none"> • Identifying existing and foreseeable respirable crystalline silica hazards in the workplace. • Taking prompt corrective measures to eliminate or minimize them.
Competent Person	3.	MAKE frequent and regular inspections of job sites, materials, and equipment to implement the written exposure control plan. NOTE: <i>Exposure Control Plans are valid for up to one year.</i>

4.8 Medical Surveillance

Actionee	Step #	Action
Supervisor	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.

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Actionee	Step #	Action
	2.	<p><u>IF</u> enrolling an employee in medical surveillance, <u>THEN CHECK</u> :</p> <ul style="list-style-type: none"> • YES for particulates on their EJTA • Silica under 14C Other Particulates • 2 or 3 for Exposure

4.9 Employee Information and Training

4.9.1 Communication of Respirable Crystalline Silica Hazards to Employees

Actionee	Step #	Action
Supervisor	1.	ENSURE training has been provided to employees who perform activities defined in Section 2.0 above <u>OR</u> are potentially exposed to Respirable Crystalline Silica above the OEL.

NOTE: *Training is provided through the Hanford web-based training, course #'s ESH010, Respirable Crystalline Silica Awareness, and ESH011, Respirable Crystalline Silica Competent Person. This training includes:*

- *The health hazards associated with exposure to respirable crystalline silica*
- *Specific tasks in the work place 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 29 CFR 1926.1153*
- *The identity of the competent person(s) designated by the employer, and*
- *The purpose of and a description of the Respirable Crystalline Silica medical surveillance program.*

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5.0 RECORD IDENTIFICATION

All records are generated, processed, and maintained in accordance with HMIS-PRO-RM-10588, *Records Management Processes*, or HMIS-PRO-RM-32281, *Electronic Records Management*, as applicable.

This procedure requires training, hazard analysis, and sampling. These records are captured in accordance with the specific procedures for those topics.

6.0 SOURCES**6.1 Source Requirements**

29 CFR 1926.1153, *Respirable Crystalline Silica*
10 CFR 851 *Worker Safety and Health Program*
DOE-0352, *Hanford Site Respiratory Protection Program*

6.2 References

HMIS-PRO-RM-10588, *Records Management Processes*
HMIS-PRO-RM-32281, *Electronic Records Management*
HMIS-PRO-SP-409, *Industrial Hygiene Monitoring, Reporting and Records Management*
HMIS-PRO-SP-11058, *Occupational Medical Qualification and Monitoring using EJTA*

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APPENDIX A. OSHA 1926.1153 Respirable Crystalline Silica

Table 1—Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤ 4 hours/shift	>4 hours/shift
(i) 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
(ii) 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
(iii) Handheld power saws for cutting fiber-cement board (with 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

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1153>

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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
(iv) 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
(v) 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
	(vi) 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

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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
(vii) 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
(viii) 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	APF 10	APF 10
(ix) 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	None	None
	OR		
	Operate from within an enclosed cab and use water for dust suppression on drill bit	None	None
(x) 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

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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
	OR		
	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
(xi) Handheld grinders for mortar removal (<i>i.e.</i> , tuckpointing)	Use grinder equipped with commercially available shroud and dust collection system	APF 10	APF 25
	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		
(xii) 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	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
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	OR		
	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
(xiii) Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface	None	None
	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	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
	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		
(xiv) 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	None	None
	Operate and maintain machine to minimize dust emissions		
(xv) 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	None	None
	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	None	None
	Operate and maintain machine to minimize dust emissions		

NOTE: Employees may print off this document for reference purposes but are responsible to check HMIS Procedure System to ensure the most current version is used to prevent unintended use of obsolete versions.

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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
	OR		
	Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant	None	None
	Operate and maintain machine to minimize dust emissions		
(xvi) 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)	None	None
	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		
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramping, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab	None	None
	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions	None	None
(xviii) 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	None	None
	OR		

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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
	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab	None	None

1926.1153(c)(2)

When implementing the control measures specified in Table 1, each employer shall:

1926.1153(c)(2)(i)

For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust;

1926.1153(c)(2)(ii)

For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust;

1926.1153(c)(2)(iii)

For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:

1926.1153(c)(2)(iii)(A)

Is maintained as free as practicable from settled dust;

1926.1153(c)(2)(iii)(B)

Has door seals and closing mechanisms that work properly;

1926.1153(c)(2)(iii)(C)

Has gaskets and seals that are in good condition and working properly;

1926.1153(c)(2)(iii)(D)

Is under positive pressure maintained through continuous delivery of fresh air;

1926.1153(c)(2)(iii)(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

1926.1153(c)(2)(iii)(F)

Has heating and cooling capabilities.

1926.1153(c)(3)

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