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## Chapter 296-840 WAC Respirable Crystalline Silica (F414-160-000)

This book contains rules for Safety Standards for respirable crystalline silica, as adopted under the Washington Industrial Safety and Health Act of 1973 (Chapter 49.17 RCW).

The rules in this book are effective April 2018. A brief promulgation history, set within brackets at the end of each section, gives statutory authority, administrative order of promulgation, and date of adoption of filing.

*The Department intends to adopt Appendices B and C in a subsequent rulemaking. Both appendices are non-mandatory and do not impose any obligations on employers not already required, the Department can use the expedited rulemaking process under RCW 34.05.353.*

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# Chapter 296-840 WAC Safety Standards for Respirable Crystalline Silica

Effective: 04/23/2018

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## **WAC 296-840-095 Definitions.**

For the purposes of this chapter the following definitions apply:

**Action level.** A concentration of airborne respirable crystalline silica of 25  $\mu\text{g}/\text{m}^3$ , calculated as an 8-hour time-weighted average (TWA).

**Competent person.** 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 must have the knowledge and ability necessary to fulfill the responsibilities set forth in WAC 296-840-140.

**Construction work.** All or any part of excavation, construction, erection, alteration, repair, demolition, and dismantling, of buildings and other structures and all operations in connection therewith; the excavation, construction, alteration and repair of sewers, trenches, caissons, conduits, pipe lines, roads and all operations pertaining thereto; the moving of buildings and other structures, and to the construction, alteration, repair, or removal of wharfs, docks, bridges, culverts, trestles, piers, abutments or any other construction, alteration, repair or removal work related thereto.

**Director.** The director of the department of labor and industries or his/her authorized representative.

**DOSH.** The division of occupational safety and health, Washington state department of labor and industries.

**Employee exposure.** The exposure to airborne respirable crystalline silica that would occur if the employee were not using a respirator.

**High-efficiency particulate air (HEPA) filter.** A filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter.

**Objective data.** 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 associated with a particular product or material or a specific process, task, or activity. The data 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.

**Permissible exposure limit (PEL).** A concentration of airborne respirable crystalline silica of 50  $\mu\text{g}/\text{m}^3$ , calculated as an 8-hour TWA.

**Physician or other licensed health care professional (PLHCP).** An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular health care services required by WAC 296-840-145.

**Regulated area.** An area, demarcated by the employer, where an employee's exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.

**Respirable crystalline silica.** Quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air quality – Particle size fraction definitions for health-related sampling.

**Specialist.** An American Board Certified Specialist in Pulmonary Disease or an American Board Certified Specialist in Occupational Medicine.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-095, filed 03/20/2018, effective 04/23/2018.]

### ***WAC 296-840-100 Scope and application.***

This chapter applies to all occupational exposures to respirable crystalline silica, except for the following:

- (1) Where employee exposure results from the processing of sorptive clays.
- (2) Where documented objective data demonstrates that employee exposures to respirable crystalline silica will remain below 25 micrograms per cubic meter of air (25 µg/m<sup>3</sup>) as an 8-hour TWA under any foreseeable conditions.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-100, filed 03/20/2018, effective 04/23/2018.]

### ***WAC 296-840-105 Exposure assessment.***

This section applies to all occupational exposures except for tasks performed according to the requirements in WAC 296-840-110.

- (1) **Permissible exposure limit (PEL).** You must ensure that no employee is exposed to an airborne concentration of respirable crystalline silica in excess of the 8-hour TWA.
- (2) **Exposure assessment.** You must 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 in (a) of this subsection or the scheduled monitoring option in (b) of this subsection.
  - (a) **Performance option.** You must assess the 8-hour TWA 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.
  - (b) **Scheduled monitoring option:**
    - (i) You must perform initial monitoring to assess the 8-hour TWA for each employee on the basis of personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification, in each work area.
    - (ii) Where several employees perform the same tasks on the same shift and in the same work area, you may sample a representative fraction of these employees in order to meet this requirement.

- (iii) In representative sampling, you must sample the employee(s) who are expected to have the highest exposure to respirable crystalline silica.
  - (iv) If initial monitoring indicates that employee exposures are below the action level, you may discontinue monitoring for those employees whose exposures are represented by such monitoring.
  - (v) Where the most recent exposure monitoring indicates that employee exposures are at or above the action level but at or below the PEL, you must repeat such monitoring within six months of the most recent monitoring.
  - (vi) 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.
  - (vii) Where the most recent (noninitial) exposure monitoring indicates that employee exposures are below the action level, you must repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven 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, except as otherwise provided in subsection (3) of this section.
- (3) **Reassessment of exposures.** You must reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the action level, or when the employer has any reason to believe that new or additional exposures at or above the action level have occurred.
- (4) **Methods of sample analysis.** You must ensure that all samples taken to satisfy the monitoring requirements of subsection (2) of this section are evaluated by a laboratory that analyzes air samples for respirable crystalline silica in accordance with the procedures in WAC 296-840-165 Appendix A—Methods of sample analysis of this chapter.
- (5) **Employee notification of assessment results.**
- (a) Individually notify each affected employee in writing of the results of that assessment or post the results in an appropriate location accessible to all affected employees in accordance with the following:
    - (i) Construction employers must notify affected employees within five working days after receiving any results of an exposure assessment in accordance with this rule.
    - (ii) All other employers must notify affected employees within fifteen working days after receiving any results of an exposure assessment in accordance with this rule.
  - (b) Whenever an exposure assessment indicates that employee exposure is above the PEL, you must describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.

**(6) Observation of monitoring.**

- (a) Where air monitoring is performed to comply with the requirements of this chapter, you must provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to respirable crystalline silica.
- (b) When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, you must provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-105, filed 03/20/2018, effective 04/23/2018.]

**WAC 296-840-110 Specified exposure control methods.**

This section applies to construction work and other occupational exposures where the task performed is indistinguishable from a construction task listed in Table 1 of this section and the task will not be performed regularly in the same environment and conditions.

- (1) For each employee engaged in a task identified in Table 1 of this section, you must fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task in Table 1 of this section, unless you assess and limit the exposure of the employee to respirable crystalline silica in accordance with WAC 296-840-105.
- (2) When implementing the control measures specified in Table 1 of this section, you must:
  - (a) For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust;
  - (b) For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust;
  - (c) For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:
    - (i) Is maintained as free as practicable from settled dust;
    - (ii) Has door seals and closing mechanisms that work properly;
    - (iii) Has gaskets and seals that are in good condition and working properly;
    - (iv) Is under positive pressure maintained through continuous delivery of fresh air;
    - (v) Has intake air that is filtered through a filter that is ninety-five percent efficient in the 0.3-10.0  $\mu\text{m}$  range (e.g., MERV-16 or better); and
    - (vi) Has heating and cooling capabilities.
- (3) Where an employee performs more than one task in Table 1 of this section 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 in Table 1 of this section 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.

**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) Hand-held 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. - When used indoors or in an enclosed area.	None APF 10	APF 10 APF 10
(iii) Hand-held 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
(iv) Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.		

**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
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - When used outdoors. - When used indoors or in an enclosed area.	None APF 10	None 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	None
(vii) Hand-held 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.	None	None



**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
	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.		
(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. Use a HEPA-filtered vacuum when cleaning holes.	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 or 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 hand-held 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. - When used indoors or in an enclosed area. OR	None APF 10	APF 10 APF 10

**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
	<p>Use tool 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 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>- When used outdoors. - When used indoors or in an enclosed area.</p>	None APF 10	APF 10 APF 10
(xi) Hand-held grinders for mortar removal (i.e., tuckpointing)	<p>Use grinder equipped with commercially available shroud and dust collection system.</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 cyclonic preseparator or filter-cleaning mechanism.</p>	APF 10	APF 25
(xii) Hand-held grinders for uses other than mortar removal	For tasks performed outdoors only:		
	<p>Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p> <p>OR</p>	None	None

**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
	<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 preseparator or filter-cleaning mechanism.</p> <p>- When used outdoors. - When used indoors or in an enclosed area.</p>	None None	None APF 10
(xiii) Walk-behind milling machines and floor grinders	<p>Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p> <p>OR</p> <p>Use machine equipped with dust collection system recommended by the manufacturer.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p>	None  None	None  None

**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
	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 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.	None	None
(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.  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	None          None

**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
	<p>Operate and maintain machine to minimize dust emissions.</p> <p>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>		
(xvi) Crushing machines	<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
(xvii) 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>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>	<p>None</p> <p>None</p>	<p>None</p> <p>None</p>

<b>Table 1 Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica</b>			
<b>Equipment/ Task</b>	<b>Engineering and Work Practice Control Methods</b>	<b>Required Respiratory Protection and Minimum Assigned Protection Factor (APF)</b>	
(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 When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	None	None

Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-110, filed 03/20/2018, effective 04/23/2018.]

### **WAC 296-840-115 Regulated areas.**

This section does not apply to occupational respirable crystalline silica exposures in construction work.

- (1) **Establishment.** You must establish a regulated area wherever an employee's exposure to airborne concentrations of respirable crystalline silica is, or can reasonably be expected to be, in excess of the PEL.
- (2) **Demarcation.** You must demarcate the regulated areas from the rest of the workplace in a manner that minimizes the number of employees exposed to respirable crystalline silica within the regulated area.
- (3) You must post signs at all entrances to regulated areas that bear the legend specified in WAC 296-840-150(2).
- (4) **Access.** You must limit access to regulated areas to:
  - (a) Persons authorized by the employer and required by work duties to be present in the regulated area;
  - (b) Any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring procedures under WAC 296-840-105; and
  - (c) Any person authorized by the department or regulations issued under it to be in a regulated area.
- (5) **Provision of respirators.** You must provide each employee and the employee's designated representative entering a regulated area with an appropriate respirator in accordance with WAC 296-840-125 and must require each employee and the employee's designated representative to use the respirator while in a regulated area.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-115, filed 03/20/2018, effective 04/23/2018.]

## ***WAC 296-840-120 Methods of compliance.***

This section does not apply to tasks listed and performed in accordance with Table 1 of WAC 296-840-110 Specified exposure control methods.

- (1) **Engineering and work practice controls.** You must use engineering and work practice controls to reduce and maintain employee exposure to respirable crystalline silica to or below the PEL, unless the employer can demonstrate that such controls are not feasible. Wherever such feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, you must nonetheless use them to reduce employee exposure to the lowest feasible level and must supplement them with the use of respiratory protection that complies with the requirements of WAC 296-840-125.
- (2) **Abrasive blasting.** In addition to the requirements of this section, you must comply with chapter [296-818](#) WAC, safety standards for abrasive blasting and other applicable DOSH standards where abrasive blasting is conducted using crystalline silica containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-120, filed 03/20/2018, effective 04/23/2018.]

## ***WAC 296-840-125 Respiratory protection.***

- (1) Where respiratory protection is required by this section, you must provide each employee an appropriate respirator that complies with the requirements of this section and chapter [296-842](#) WAC, Respirators.
- (2) **Respiratory protection is required:**
  - (a) Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls;
  - (b) Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible;
  - (c) During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL;
  - (d) During periods when an employee or employees are in a regulated area; and
  - (e) Where specified for tasks performed according to the requirements in Table 1 of WAC 296-840-110 Specified exposure control methods.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-125, filed 03/20/2018, effective 04/23/2018.]

## ***WAC 296-840-130 Respiratory protection program.***

- (1) Where respirator use is required by this chapter, you must institute a respiratory protection program in accordance with chapter [296-842](#) WAC, Respirators.

- (2) **Specified exposure control methods.** For tasks listed in Table 1 of WAC 296-840-110, if you fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1 of WAC 296-840-110, you will be considered to be in compliance with WAC 296-840-125(1) and the requirements for selection of respirators in chapter [296-842](#) WAC with regard to exposure to respirable crystalline silica.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-130, filed 03/20/2018, effective 04/23/2018.]

### ***WAC 296-840-135 Housekeeping.***

- (1) You must not allow dry sweeping or dry brushing where such 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.
- (2) You must not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to employee exposure to respirable crystalline silica unless:
- (a) The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air; or
  - (b) No alternative method is feasible.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-135, filed 03/20/2018, effective 04/23/2018.]

### ***WAC 296-840-140 Written exposure control plan.***

- (1) You must establish and implement a written exposure control plan that contains at least the following elements:
- (a) A description of the tasks in the workplace that involve exposure to respirable crystalline silica;
  - (b) A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task; and
  - (c) A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica.
- (2) You must review and evaluate the effectiveness of the written exposure control plan at least annually and update it as necessary.
- (3) You must make the written exposure control plan readily available for examination and copying, upon request, to each employee covered by this chapter, their designated representatives, and the director.
- (4) In addition to the above written exposure control plan requirements, you must include the following elements for construction work:
- (a) 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.



- (b) A competent person to make frequent and regular inspections of job sites, materials, and equipment to implement the written exposure control plan.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-140, filed 03/20/2018, effective 04/23/2018.]

### **WAC 296-840-145 Medical surveillance.**

- (1) Medical surveillance must be made available at no cost to the employee and at a reasonable time and place for any employee:
  - (a) Doing construction tasks and required by this chapter to use a respirator for thirty or more days per year.
  - (b) Doing work other than construction tasks and will be occupationally exposed to respirable crystalline silica at or above the action level for thirty or more days per year.
- (2) You must ensure that all medical examinations and procedures required by this chapter are performed by a PLHCP as defined in WAC 296-840-095.
- (3) **Initial examination.** You must make available an initial (baseline) medical examination within thirty days after initial assignment, unless the employee has received a medical examination that meets the requirements of this chapter within the last three years. The examination must consist of:
  - (a) 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 (e.g., shortness of breath, cough, wheezing); smoking status and history; and history of tuberculosis. The history of tuberculosis should include completion of the Washington state department of labor and industries form F252-113-000, Adult Tuberculosis Screening Tool for Workers Exposed to Respirable Crystalline Silica, located in WAC 296-840-175, Appendix C of this chapter.
  - (b) A physical examination with special emphasis on the respiratory system;
  - (c) A chest X-ray (a single posteroanterior radiographic projection or radiograph of the chest at full inspiration recorded on either film (no less than 14 x 17 inches and no more than 16 x 17 inches) or digital radiography systems), interpreted and classified according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconioses by a NIOSH-certified B Reader;
  - (d) A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course;
  - (e) Testing for latent tuberculosis infection; and
  - (f) Any other test deemed appropriate by the PLHCP.

- (4) **Periodic examinations.** You must make available medical examinations that include the procedures described in this section, except for subsection (3)(e) of this section, at least every three years or more frequently if recommended by the PLHCP.
- (5) **Information provided to the PLHCP.** You must ensure that the examining PLHCP has a copy of this standard, and must provide the PLHCP with the following information:
  - (a) A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to respirable crystalline silica;
  - (b) The employee's former, current, and anticipated levels of occupational exposure to respirable crystalline silica;
  - (c) A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used or will use that equipment; and
  - (d) Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the employer.
- (6) **PLHCP's written medical report for the employee.** You must ensure that the PLHCP explains to the employee the results of the medical examination and provides each employee with a written medical report within thirty days of each medical examination performed. The written report must contain:
  - (a) A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica and any medical conditions that require further evaluation or treatment;
  - (b) Any recommended limitations on the employee's use of respirators;
  - (c) Any recommended limitations on the employee's exposure to respirable crystalline silica; and
  - (d) A statement that the employee should be examined by a specialist under subsection (9)(a) of this section if the chest X-ray provided in accordance with this chapter is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.
- (7) **PLHCP's written medical opinion for employers.** You must obtain a written medical opinion from the PLHCP within thirty days of the medical examination. The written opinion must contain only the following:
  - (a) The date of the examination;
  - (b) A statement that the examination has met the requirements of this section;
  - (c) Any recommended limitations on the employee's use of respirators; and
  - (d) If the employee provides written authorization, the written opinion shall also contain either or both of the following:

- (i) Any recommended limitations on the employee's exposure to respirable crystalline silica;
  - (ii) A statement that the employee should be examined by a specialist under subsection (9)(a) of this section if the chest X-ray provided in accordance with this chapter is classified as 1/0 or higher by the B Reader, or if referral to a specialist is otherwise deemed appropriate by the PLHCP.
- (8) You must ensure that each employee receives a copy of the written medical opinion described in subsection (7) of this section within thirty days of each medical examination performed.
- (9) **Additional examinations.**
- (a) If the PLHCP's written medical opinion indicates that an employee should be examined by a specialist, you must make available a medical examination by a specialist within thirty days after receiving the PLHCP's written opinion. You must ensure that:
    - (i) The examining specialist is provided with all of the information that the employer is obligated to provide to the PLHCP in accordance with subsection (5) of this section.
    - (ii) The specialist explains to the employee the results of the medical examination and provides each employee with a written medical report within thirty days of the examination. The written report shall meet the requirements of subsection (6)(a), (b), and (c) of this section.
  - (b) You must obtain a written opinion from the specialist within thirty days of the medical examination. The written opinion shall meet the requirements of subsection (7), except (b) and (d)(ii) of this section.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-145 filed 03/20/2018, effective 04/23/2018.]

## ***WAC 296-840-150 Communication of respirable crystalline silica hazards to employees.***

- (1) **Regarding hazard communication you must:**
- (a) Include respirable crystalline silica in the program established to comply with chapter [296-901](#) WAC, Globally harmonized system for hazard communication.
  - (b) Ensure that each employee has access to labels on containers of crystalline silica and safety data sheets, and is trained in accordance with WAC [296-901-14016](#) and subsection (3) of this section. The employer shall ensure that at least the following hazards are addressed: Cancer, lung effects, immune system effects, and kidney effects.
- (2) **Signs.** Where a regulated area is established you must post signs at all entrances to the regulated areas that bear the following legend:

**DANGER  
RESPIRABLE CRYSTALLINE SILICA  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
WEAR RESPIRATORY PROTECTION IN THIS AREA  
AUTHORIZED PERSONNEL ONLY**

- (3) Regarding employee information and training, you must ensure that each employee covered by this chapter can demonstrate knowledge and understanding of at least the following:
- (a) The health hazards associated with exposure to respirable crystalline silica;
  - (b) Specific tasks in the workplace that could result in exposure to respirable crystalline silica;
  - (c) Specific measures you have implemented to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used;
  - (d) The contents of this chapter;
  - (e) The purpose and a description of the medical surveillance program required by WAC 296-840-145, and notice that the medical surveillance program under this chapter is not intended to reduce a worker's legal rights under Title 51 RCW;
  - (f) The identity of the competent person designated by the employer in accordance with WAC 296-840-140 (4)(b).
- (4) You must make a copy of this chapter readily available without cost to each employee covered by this chapter.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-150, filed 03/20/2018, effective 04/23/2018.]

### ***WAC 296-840-155 Recordkeeping.***

- (1) **Air monitoring data.**
- (a) You must make and maintain an accurate record of all exposure measurements taken to assess employee exposure to respirable crystalline silica, as prescribed in WAC 296-840-105(2). This record must include at least the following information:
    - (i) The date of measurement for each sample taken;
    - (ii) The task monitored;
    - (iii) Sampling and analytical methods used;
    - (iv) Number, duration, and results of samples taken;
    - (v) Identity of the laboratory that performed the analysis;
    - (vi) Type of personal protective equipment, such as respirators, worn by the employees monitored; and

- (vii) Name, Social Security number, and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.
  - (b) You must ensure that exposure records are maintained and made available in accordance with chapter [296-802](#) WAC, Employee medical and exposure records.
- (2) **Objective data.**
- (a) You must make and maintain an accurate record of all objective data relied upon to comply with the requirements of this chapter. This record must include at least the following information:
    - (i) The crystalline silica-containing material in question;
    - (ii) The source of the objective data;
    - (iii) The testing protocol and results of testing;
    - (iv) A description of the 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.
  - (b) You must ensure that objective data are maintained and made available in accordance with chapter [296-802](#) WAC, Employee medical and exposure records.
- (3) **Medical surveillance.**
- (a) You must make and maintain an accurate record for each employee covered by medical surveillance under WAC 296-840-145. The record must include the following information about the employee:
    - (i) Name and Social Security number;
    - (ii) A copy of the PLHCPs' and specialists' written medical opinions; and
    - (iii) A copy of the information provided to the PLHCPs and specialists.
  - (b) You must ensure that medical records are maintained and made available in accordance with chapter [296-802](#) WAC, Employee medical and exposure records.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-155, filed 03/20/2018, effective 04/23/2018.]

## ***WAC 296-840-160 Effective dates.***

This chapter becomes effective on April 23, 2018. Employers must comply with obligations of this chapter in accordance with the following:

- (1) For occupational exposures to respirable crystalline silica in construction work, employers must comply with all obligations of this chapter by October 1, 2018. This includes the sample analysis requirement.
- (2) For all occupational exposures to respirable crystalline silica other than construction work, employers must comply with this chapter by July 1, 2019, except as follows:

- (a) Where employee exposure to respirable crystalline silica is above the PEL for thirty or more days per year medical surveillance requirements in WAC 296-840-145 must be complied with by July 1, 2019.
- (b) Where employee exposure to respirable crystalline silica is at or above the action level for thirty or more days per year medical surveillance requirements in WAC 296-840-145 must be complied with by June 23, 2020.
- (c) For hydraulic fracturing operations in the oil and gas industry, obligations for engineering controls under WAC 296-840-120(1) begin July 1, 2022.

Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-100, filed 03/20/2018, effective 04/23/2018.]

## ***WAC 296-840-165 Appendix A Methods of sample analysis—Mandatory.***

This appendix specifies the procedures for analyzing air samples for respirable crystalline silica, as well as the quality control procedures that employers must ensure that laboratories use when performing an analysis required under WAC 296-840-105(4). Employers must ensure that such a laboratory:

- (1) Evaluates all samples using the procedures specified in one of the following analytical methods: OSHA ID-142; NMAM 7500; NMAM 7602; NMAM 7603; MSHA P-2; or MSHA P-7;
- (2) Is accredited to ANS/ISO/IEC Standard 17025:2005 with respect to crystalline silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs;
- (3) Uses the most current National Institute of Standards and Technology (NIST) or NIST traceable standards for instrument calibration or instrument calibration verification;
- (4) Implements an internal quality control (QC) program that evaluates analytical uncertainty and provides employers with estimates of sampling and analytical error;
- (5) Characterizes the sample material by identifying polymorphs of respirable crystalline silica present, identifies the presence of any interfering compounds that might affect the analysis, and makes any corrections necessary in order to obtain accurate sample analysis; and
- (6) Analyzes quantitatively for crystalline silica only after confirming that the sample matrix is free of uncorrectable analytical interferences, corrects for analytical interferences, and uses a method that meets the following performance specifications:
  - (a) Each day that samples are analyzed, performs instrument calibration checks with standards that bracket the sample concentrations;
  - (b) Uses five or more calibration standard levels to prepare calibration curves and ensures that standards are distributed through the calibration range in a manner that accurately reflects the underlying calibration curve; and
  - (c) Optimizes methods and instruments to obtain a quantitative limit of detection that represents a value no higher than 25 percent of the PEL based on sample air volume.

[Statutory Authority: Chapter RCW 49.17.010, .040, .050, and .060. 18-07-098 (Order 16-20), § 296-840-165, filed 03/20/2018, effective 04/23/2018.]