ENVIRONMENTAL HEALTH & SAFETY

UNIVERSITY *of* WASHINGTON

UNIVERSITY OF WASHINGTON

RESPIRABLE CRYSTALLINE SILICA SAFETY MANUAL

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PURPOSE

The Respirable Crystalline Silica Safety Manual outlines the responsibilities of University units, personnel and the Environmental Health & Safety Department (EH&S) to protect personnel from occupational respirable crystalline silica exposure. This document also contains guidelines and procedures for exposure control, respiratory protection, and medical evaluations.

The Respirable Crystalline Silica Safety Manual describes accepted practices for controlling exposure to respirable crystalline silica as directed by Washington state respirable crystalline silica regulations outlined in Washington Administrative Code (WAC) 296-840.

SCOPE

The Respirable Crystalline Silica Safety Manual applies to all University units, organizations, and departments working with crystalline silica-containing materials. Silica-containing materials include, but are not limited to, the following materials:

- Asphalt
- Bricks
- Brick mortar
- Cement
- Cement masonry unit (CMU)
- Concrete products
- Ceramic Tile
- Drywall
- Grout
- Paints containing silica
- Plaster
- Refractory Mortar
- Refractory Units
- Rock, gravel, sand, soil
- Sand blasting grit (silica sand)
- Sheetrock and joint compound or “mud”
- Terrazzo

The Washington state respirable crystalline silica regulation bases exposure and respiratory protection guidelines on the type of work conducted. These activities include, but are not limited to:

- Demolition of masonry materials
- New construction, alteration, repair, or renovation
- Clean up of crystalline silica

- Maintenance operations that disturb crystalline silica
- Laboratory, shop, or craft activities involving crystalline silica
- Ceramics
- Glass manufacture
- Drywall finishing
- Abrasive blasting
- Crushing, loading, hauling, and dumping rock

ROLES AND RESPONSIBILITIES

Role	Responsibilities
University units, organizations, and departments	• Comply with the requirements in the Respirable Crystalline Silica Safety Manual and all applicable laws, regulations, codes, standards, and best industry practices. • Ensure a qualified person oversees the management of the unit or site-specific respirable crystalline silica safety program. • Provide the necessary resources, including designating a competent person, to review all crystalline silica exposure control work plans, standard operating procedures, hazard review checklists and/or job hazard analyses. • Identify hazards prior to commencing work where there is a potential to impact silica-containing materials. • Ensure academic departments with laboratories, shops, art studios, and craft-making spaces where activities, including registered student organizations, using crystalline silica-containing materials are conducted, complete a respirable crystalline silica exposure control work plan, develop standard operating procedures, or conduct and document a job hazard analysis, for specific work tasks to ensure proper exposure controls are implemented and personal protective equipment is provided and used in the manner described in this document. • Ensure personnel receive the applicable respirable crystalline silica exposure control work plan, standard operating procedures, or job hazard analysis prior to beginning work.
Facilities units–all sites The following campuses, organizational units, and off-site locations that conduct their own building maintenance and/or custodial service: UW Facilities - Seattle	Each Facilities unit must comply with the requirements described in the Respirable Crystalline Silica Safety Manual including the following: • Implement a unit and/or site-specific respirable crystalline silica exposure control work plan per the requirements of this document that complies with all applicable laws, regulations, codes, standards, and best industry practices.

UW Facilities - Bothell UW Facilities - Tacoma UWMC – Montlake UWMC - Northwest Harborview Medical Center Center for Sustainable Forestry at Pack Forest Friday Harbor Laboratories Olympic Natural Resources Center Intercollegiate Athletics Student Life	• Develop and implement exposure controls, train employees, maintain records, restrict access to regulated areas whenever an employee's exposure to airborne concentrations of respirable crystalline silica is, or can reasonably be expected to be, in excess of the PEL, and maintain labels and signs to warn of regulated areas.
Competent Person	• Reviews and approves documented written crystalline silica exposure control work plans, standard operating procedures, hazard review checklists and/or job hazard analyses to ensure exposures to respirable crystalline silica does not exceed regulatory limits.
Environmental Health and Safety (EH&S)	• Develop and maintain the University's Respirable Crystalline Silica Safety Manual as an element of the University's Respirable Crystalline Silica Safety Program. • Assist University units, organizations and departments maintain regulatory compliance by providing respirable crystalline silica hazard training, worksite assessment, exposure monitoring, and medical surveillance. • Audit the Respirable Crystalline Silica Safety Program periodically. • Complete medical surveillance examinations and procedures at the UW Employee Health Center as outlined in WAC 296-840-145, WAC 296-840-170 Appendix B – Medical Surveillance Guidelines, and WAC 296-840-175 Appendix C – Adult Tuberculosis Screening Tool for Workers Exposed to Respirable Crystalline Silica.
Personnel	• Follow all requirements outlined in the Respirable Crystalline Silica Safety Manual. • Follow all requirements outlined in the unit or site-specific respirable crystalline silica exposure control work plan. • Follow instructions provided in crystalline silica exposure control work plan(s) and standard operating procedures provided by the unit, department or organization. • Properly handle and work with silica-containing material per the respirable crystalline silica exposure control work plan to

	minimize the potential for their own and others' exposure to respirable crystalline silica. • Stop work if potentially hazardous conditions are identified and report such conditions to a supervisor prior to resumption of work. • Properly store and maintain personal protection equipment (PPE). • Immediately report all safety incidents and any potential health effects to their supervisor and through the online accident reporting system (OARS).

DEFINITIONS

Action level (AL): A concentration of airborne respirable crystalline silica of 25 µg/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 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

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 µg/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 them to independently provide or be delegated the responsibility to provide some or all 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

TWA_{8e}: Refers to the equivalent 8-hour exposure that is the sum of respirable crystalline silica exposure concentrations multiplied by the length of time of exposure at each concentration, with the sum divided by 8 hours

WHAT IS CRYSTALLINE SILICA?

Crystalline silica is a naturally occurring compound with the most abundant crystalline form being α-quartz (i.e., alpha quartz), which is the most common mineral on earth's continents. Non-crystalline silica is found in glass, silicon carbide, and silicone – which are much less hazardous to the lungs; however, respirable crystalline silica is the primary focus of this safety manual.

Crystalline silica is a component of concrete, cement, brick and mortar, granite and other stone materials, sand products containing quartz, and some soils. Any of these materials will release silica dust into the air when subject to actions like grinding, sawing, drilling, chipping, or crushing.

These dust particles, mostly 10 micrometers in size and smaller, are too small to see, but can penetrate to the deepest part of the human lung when inhaled and cause physiological damage. The smaller the crystalline silica particles, the greater the risk the particles will cause damage to the lungs when inhaled.

The following are examples of job-related activities conducted in the construction and other industries which may include risks of exposure to respirable crystalline silica:

CONSTRUCTION

- Sandblasting
- Jack hammering
- Rock drilling, cutting, chipping, or polishing
- Brick or tile cutting and sawing
- Concrete drilling, sawing, grinding, and polishing
- Demolition
- Asphalt mixing
- Tuck-pointing

OTHERS

- Stone countertop fabrication
- Diatomaceous earth processing
- Pottery production

- Foundries
- Work on linings in kilns and cupola furnaces
- Mining
- Manufacturing of glass

HEALTH EFFECTS FROM RESPIRABLE CRYSTALLINE SILICA EXPOSURE

Workers can breathe in harmful amounts of silica dust over time and eventually develop a disabling lung disease, such as silicosis or lung cancer, when effective dust control measures are not used. As time progresses, the crystalline silica causes scarring of the lungs, impairing the gas exchange ability of the lungs. Silicosis is caused by inhalation and deposition of respirable crystalline silica particles less than ten micrometers in diameter.

Silicosis, usually a nodular pulmonary fibrosis, is the disease most associated with exposure to respirable crystalline silica. Respirable crystalline silica exposure has also been linked to kidney and auto-immune diseases. A worker may develop one of three types of silicosis, depending on the airborne concentration of respirable crystalline silica:

Chronic Silicosis	Occurs after 10 or more years of exposure to relatively low concentrations and is the most common
Accelerated Silicosis	Develops after 5-10 years of exposure to high concentrations
Acute Silicosis	Develops after a few weeks to 5 years of exposure to extremely high concentrations

Symptoms of silicosis include the following:

Shortness of Breath	Possible Fever	Fatigue
Loss of Appetite	Chest Pain	Dry, nonproductive cough
Respiratory failure	Fever	Darkening of skin

The best way to prevent diseases associated with respirable crystalline silica exposure is implement controls such as engineering controls, wet methods, and personal protective equipment (PPE).

UNIT OR SITE-SPECIFIC PROGRAM REQUIREMENTS

EXPOSURE ASSESSMENT

University facilities and work processes where crystalline silica-containing material is used or disturbed must be identified and the hazard assessed by the unit or department residing in the facility or performing the work. If airborne respirable crystalline silica is generated, or preplanning determines a potential, the unit or department should contact EH&S for consultation on air monitoring for exposure assessment, as necessary. An exposure assessment is not required if work practices described in WAC 296-840-110 are adhered to.

Exposure assessments will be conducted for representative tasks in which crystalline silica-containing material is used or disturbed. Exposure assessments can be conducted by EH&S or delegated to other qualified personnel. If the work activity is not listed in Table 1 of WAC 296-840-110, air monitoring shall be performed in accordance with the section on Air Monitoring.

If monitoring results indicate occupational exposure levels are above the PEL, the unit or department must develop an exposure control work plan to reduce personnel exposure. EH&S will review the plan upon request.

EXPOSURE LIMITS

As defined above in Definitions, the Washington state **action level** and **permissible exposure limit** for respirable crystalline silica are:

Action Level: A concentration of airborne respirable crystalline silica of 25 µg/m^3, calculated as an 8-hour time-weighted average (TWA)

Permissible Exposure Limit: A concentration of airborne respirable crystalline silica of 50 µg/m^3, calculated as an 8-hour TWA

Requirements related to exposures that meet or exceed the AL and PEL are described below. Engineering controls, safe work practices and PPE, including respiratory protection, are recommended to limit exposures to the lowest reasonably achievable levels.

AIR MONITORING

INITIAL EXPOSURE MONITORING

EH&S and/or the responsible unit or department will conduct representative personal exposure monitoring on selected individuals working with respirable crystalline silica-containing material during a specific activity.

> **If initial exposure monitoring results indicate exposures for the task are below the AL of 25 µg/m^3 TWA$_{8e}$, no further monitoring is required**; however, site specific work practices and PPE are still required to minimize exposure, contamination, and "take-home" silica to the lowest feasible levels.
>
> **If initial exposure monitoring results indicate exposures are at or greater than 50 µg/m^3 TWA$_{8e}$, respiratory protection is required** when performing the activity, along with site specific work practices, proper PPE, and other controls depending on the exposure level.

If there are any changes in the facility/work area or related work practices, repeat the exposure monitoring.

PERIODIC EXPOSURE MONITORING

Periodic monitoring is required whenever respirable crystalline silica exposures are greater than or equal to the AL. University units and departments with personnel who are engaging in work with silica-containing material are responsible for arranging and bearing the cost of periodic monitoring. If periodic monitoring is necessary, the frequency will be:

Measured Concentration	Monitoring Frequency
Greater than or equal to AL (25 µg/m3 TWA8e)	6 months
Greater than or equal to PEL (50 µg/m3 TWA8e)	3 months

TERMINATION OF EXPOSURE MONITORING

Periodic monitoring may be discontinued if results from two consecutive sampling periods taken at least seven days apart show that employee exposure is below the AL. Prior to termination, the initial hazard assessment must be reviewed and revised to incorporate any changes.

SAMPLING METHODS

Personal exposure monitoring must be representative of a full shift and will be conducted using one of the following analytical methods: OSHA ID-142, NMAM 7500, NMAM 7602, NMAM 7603, MSHA P-2, or MSHA P-7. The laboratory must be accredited to ANS/ISO/IEC Standard 17011:2003 for implementation of quality assessment programs, as well as meet other requirements outlined in WAC 296-840-165 Appendix A – Methods of Sample Analysis. Samples must be delivered to the analytical laboratory under chain-of-custody.

REPORTING OF RESULTS

Within five days of receipt of laboratory results, EH&S will notify the unit or department, which must disseminate in writing the exposure assessment reports to affected personnel. If exposures exceed the PEL, the written notification must include steps the unit or department will take to reduce exposure, including engineering and/or administrative controls (described in the Exposure Controls section of this document).

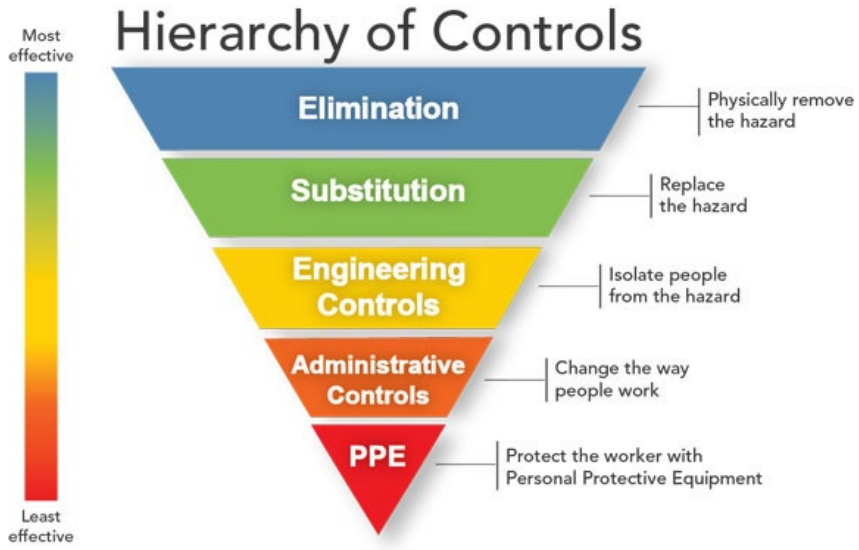
OBSERVATION OF MONITORING

The department must allow affected employees or their designated representatives to observe any exposure monitoring. Whenever observation of exposure monitoring requires entry into an area where the use of respirators, protective clothing or equipment is required, the department must provide the observer and ensure the use of such respirators, clothing, and equipment, and must require the observer to comply with all other applicable safety and health procedures.

EXPOSURE CONTROLS

HIERARCHY OF CONTROLS

Control crystalline silica hazards through (listed in order of most effective to least effective) elimination, substitution, engineering controls, administrative controls and lastly, the use of appropriate PPE. The "Hierarchy of Controls" shown below is the strategy used for the selection of controls, which prioritizes the types of controls that are most effective in eliminating or reducing the risk of exposure to a hazard.



Elimination of use of crystalline silica-containing materials is the most effective control for silica hazards, or changing a process so silica is no longer needed.

Substitution of crystalline silica-containing materials with a less hazardous material can eliminate the potential for exposure but may introduce other hazards that would need to be evaluated and controlled.

Engineering Controls include ventilation systems, special tools, and other methods to isolate workers from the hazards. Power tools, such as drills, saws, rotary hammers, and sanders with attached local HEPA exhaust ventilation are very effective exposure controls when working with crystalline silica-containing materials.

Some common construction tools and equipment have integrated water spray systems, an engineering control that includes slurry or wet abrasive systems, hydro blast systems, and misting systems. When using wet methods, clearly describe containment and cleanup in the crystalline silica exposure control work plan.

Administrative Controls may include developing and implementing an exposure control work plan, standard operating procedure (SOP), conducting a job hazard analysis (JHA) or hazard review checklist (HRC) for the job or task, and requiring workers to use specific safe work practices. It may also include job rotation or limiting the duration and frequency of the job or task to minimize the potential exposure.

Personal Protective Equipment (PPE). Personnel must wear specific respiratory protection as determined by WAC 296-840-110 Specified exposure control methods, Table 1, or where determined by an exposure assessment. The proper level of protection depends on the task and tools used to perform the task. The tables below should be used as a guide for determining the appropriate PPE to wear. If applicable exposure monitoring data is available, the level of PPE should reflect the expected level of exposure. If exposure assessment data is not available for a specific task, an exposure assessment should be conducted as described in the Air Monitoring section of this document.

Where respirable crystalline silica exposures are unknown or cannot be adequately controlled by engineering or administrative controls, respirators must be used. Personnel who are required to wear respirators must obtain medical clearance to wear respirators, attend respiratory protection training and be fit tested for a specific respirator as required by the UW Respiratory Protection Program and described in the Respiratory Protection section of this document.

SPECIFIED EXPOSURE CONTROL METHODS

Washington state has identified tasks involving the disturbance of crystalline-silica and assigned required engineering controls and a minimum respiratory protection factor to each one. The specified respiratory protection requirements are task-time dependent in two categories, less than or equal to four hours, and greater than four hours. When performing tasks which are *indistinguishable* from those described in Table 1 of WAC 296-840-110, located in Appendix A, an exposure assessment is not required. When employees are engaging in tasks identified in Table 1, the engineering controls, work practices, and respiratory protection are to be implemented as described in WAC 296-840-110.

For measures implemented that include an enclosed cab or booth, ensure that all of the following apply to the enclosed cab or booth:

- Is maintained 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 ninety-five percent efficient in the 0.3-10.0 µm range (e.g. MERV 16 or better); and
- Has heating and cooling capabilities.

REGULATED AREAS

In non-construction work areas where employees may be exposed to airborne concentrations of respirable crystalline silica in excess of the PEL, a regulated area must be demarcated from the rest of the workplace. The regulated area minimizes the number of employees exposed to respirable crystalline silica.

SIGNAGE

The following language must be included on warning signs and posted at all entrances to each demarcated regulated area where an employee's exposure to respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.

DANGER

RESPIRABLE CRYSTALLINE SILICA

MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS

WEAR RESPIRATORY PROTECTION IN THIS AREA

AUTHORIZED PERSONNEL ONLY

ACCESS

The regulated area must be restricted to authorized persons only, designated representatives to observe monitoring procedures, and persons authorized by the unit, department or regulations issued under WAC 296-840-105.

HAZARD COMMUNICATION

LABELING AND SAFETY DATA SHEETS

Crystalline silica-containing products need to be clearly labeled with the original manufacturer's label and hazard warnings. If transferred to other containers, secondary labels must be put on the container according to Globally Harmonized System (GHS) requirements.

Personnel must be provided with access to safety data sheets to inform them of hazards associated with crystalline silica and safety precautions. Safety data sheets should meet the GHS classification criteria that includes the minimum sixteen standard sections. If manufacturer supplied safety data sheet does not meet this requirement, the unit or department should contact the manufacturer for the GHS version.

RESPIRATORY PROTECTION

When specified in WAC 296-840-110 Table 1, during an exposure assessment, or when airborne contaminants cannot be adequately controlled by engineered exhaust ventilation, respiratory protection may be necessary.

The use of respiratory protection has very stringent regulatory requirements. Users must participate in the UW Respiratory Protection Program, which includes medical clearance, annual training, and fit testing.

Respiratory protection is not required only after a "negative exposure assessment (NEA)" has been conducted and exposure levels are verified by air monitoring to be less than the AL of 25 $\mu g/m^3$ TWA_{8e}.

EXPOSURE CONTROL PLAN

If occupational exposure to crystalline silica by personnel is known or has the potential to be at or above the AL, regardless of whether respiratory protection is used, the University unit or departments in which the individual(s) works must **establish and implement a written crystalline silica exposure control plan prior to beginning a project**. A blank exposure control work plan template is provided in Appendix A.

The exposure control work plan must contain at least the following:

- A description of the tasks in the workplace that involve exposure to respirable crystalline silica;
- A description of the engineering controls, safe work practices, and respiratory protection used to limit personnel exposure to respirable crystalline silica for each task; and
- A description of the housekeeping measures used to limit personnel exposure to respirable crystalline silica.

In addition to the above written exposure control work plan requirements, the following elements must be included for **construction work**:

- A description of procedures used to restrict access to work areas, when necessary, to minimize the number of personnel exposed to respirable crystalline silica and their level of exposure, including exposures generated by non-UW employers or vendors and contractors
- A competent person to make frequent and regular inspections of job sites, materials, and equipment to implement the written exposure control work plan

Laboratories and **shops** in support of academic departments may complete an exposure control work plan and incorporate it into a standard operating procedure (SOP) or job hazard analysis (JHA). The SOP or JHA shall be included in their health and safety plan (Accident Prevention Plan) for any task involving crystalline silica-containing materials. A competent person is responsible for reviewing and approving all JHAs or SOPs to ensure adherence with the requirements of this document.

ADDITIONAL CONTROLS FOR EXPOSURES EXCEEDING THE ACTION LEVEL

Where occupational exposures to respirable crystalline silica are above the AL, even with respiratory protection or when the exposure is unknown, administrative and/or engineering controls are required. Follow up exposure assessments will be conducted to determine the effectiveness of the control measures. A documented crystalline silica exposure control work plan, SOP, or JHA/HRC shall be completed by the unit, organization, or department to document all controls identified to ensure personnel are protected from potential exposures above the AL.

TRAINING

Safety training courses are listed on the EH&S website.

CRYSTALLINE SILICA SAFETY TRAINING

Personnel who may work with or potentially be exposed to crystalline silica-containing materials must receive Crystalline Silica Safety Training. This online course explains the hazards of crystalline silica exposure if silica-containing materials are disturbed, the nature of crystalline silica, products that may contain crystalline silica, health hazards of crystalline silica, routes of exposure, signage, and how to control crystalline silica exposure.

Crystalline Silica Safety Training is an online course provided by EH&S. Equivalent training may be provided by facilities departments that routinely work with or disturb crystalline silica-containing materials.

RESPIRATORY PROTECTION TRAINING

Personnel working with crystalline silica or disturbing materials containing crystalline silica *and* who are required to wear respiratory protection must participate in the UW Respiratory Protection Program and receive respiratory protection training. Participation in the Respiratory Protection Program includes medical clearance, and annual training and fit testing.

MEDICAL SURVEILLANCE

The EH&S occupational health nurse manager will coordinate medical surveillance activities. Medical examinations and consultations must be made available by the University unit or department to all University personnel who are:

> Doing construction tasks and required by WAC 296-840 to use a respirator for 30 or more days per year; or
>
> Doing work other than construction tasks and will be occupationally exposed to respirable crystalline silica at or above the AL (25 µg/m^3 TWA_{8e}) for 30 or more days per year.

An initial baseline medical examination must be made available to personnel who meet the conditions above within 30 days after initial assignment, unless the individual(s) has received a medical examination that meets the requirements outlined in WAC 296-840. The initial baseline examination requirements are described in WAC 296-840-145.

Periodic examinations must be offered to personnel who meet the conditions above at least every three years or more frequently if recommended by the physician or other licensed health care professional (PLHCP). Additional medical surveillance information is in WAC 296-840-145, WAC 296-840-170 Appendix B, and WAC 296-840-175 Appendix C.

AUDITS AND INSPECTIONS

Frequent and regular inspections of job sites, materials, and equipment will be performed by the competent person identified in the crystalline silica exposure control work plan. When construction work is performed, these inspections must be made by a competent person and documented in writing.

The University's Respirable Crystalline Silica Safety Program is audited by the EH&S Respirable Crystalline Silica Safety Program Manager on a regular basis and changes are made to reflect updates in current regulations and best safe work practices to ensure maximum protection for personnel working with or disturbing silica-containing materials.

RECORDKEEPING

University units and departments must keep records of air monitoring data, objective data, and medical surveillance records as required in WAC 296-840-155.

AIR MONITORING DATA

Exposure measurements collected to assess personnel exposure to respirable crystalline silica must include all of the following information:

- Date of measurement for each sample taken
- Task monitored
- Sampling and analytical methods used
- Number, duration, and results of samples taken
- Identity of the laboratory that performed the analysis
- Type of personal protective equipment, such as respirators, worn by the monitored personnel
- Name, Social Security number, and job classification of all employees represented by the monitoring, indicating which personnel were monitored

OBJECTIVE DATA

The University of Washington units and departments that conduct exposure monitoring or request exposure monitoring services from a third party shall make and maintain an accurate record of all objective data relied upon to comply with the requirements in WAC 296-840 Respirable Crystalline Silica. The record must include all of the following information:

- The crystalline silica-containing material in question
- The source of the objective data
- The testing protocol and results of testing
- A description of the process, task, or activity on which the objective data were based
- Other data relevant to the process, task, activity, material, or exposures on which the objective data were based

MEDICAL SURVEILLANCE

The University respective employee health center shall make and maintain an accurate private and confidential medical record for individuals participating in medical surveillance and must include the following information about each individual:

- Name and Social Security number;
- A copy of the PLHCPs' and specialists' written medical opinions; and
- A copy of the information provided to the PLHCPs and specialists.

Record retention times specifically associated with the above documents is outlined below and is from WAC 296-802.

Record Type	**Minimum Retention Time**
Exposure assessments/Air monitoring data	30 years from the date the exposure record was made
Medical records	Duration of employment plus 30 years

RESOURCES

ENVIRONMENTAL HEALTH & SAFETY UNIVERSITY of WASHINGTON	UW EH&S - Crystalline Silica UW Respiratory Protection Program
Washington State Department of Labor & Industries	WAC 296-840 Respirable Crystalline Silica WAC 296-818 Abrasive Blasting WAC 296-155-367 Masonry Saws WAC 296-842 Respirators
OSHA	Silica, Crystalline

APPENDIX A – TABLE 1 – SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA

----------See next page----------

Table 1: Specified Exposure Control Measures – WAC 296-840-110

Equipment / Task	Controls	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 Hours/Shift	> 4 Hours/Shift
Stationary Masonry Saws 	Use a 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
Hand-held power saws (any blade diameter) 	Use a 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
Hand-held power saws for cutting fiber cement board **(with blade diameter of 8 inches or less)** 	For tasks performed outdoors only: Use a saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. The 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

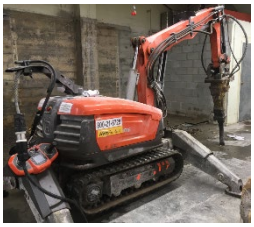
Equipment / Task	Controls	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 Hours/Shift	> 4 Hours/Shift
Walk-behind saws 	Use a saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions: - When used outdoors - When used indoors or in an enclosed area	None APF 10	None APF 10
Drivable saws 	For tasks performed outdoors only: Use a 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
Rig-mounted core saws or drills 	Use a 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
Hand-held and stand-mounted drills **(including impact and rotary hammer drills)** 	Use a drill equipped with a 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

Equipment / Task	Controls	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 Hours/Shift	> 4 Hours/Shift
	The 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.		
Dowel drilling rigs for concrete 	For tasks performed outdoors only: Use a 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
Vehicle-mounted drilling rigs for rock and concrete	Use a 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. OR Operate within an enclosed cab and use water for dust suppression on the drill bit.	None None	None None
Jackhammers and hand-held powered chipping tools 	Use a tool with a 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 Use a tool equipped with a commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's	None APF 10	APF 10 APF 10

Equipment / Task	Controls	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 Hours/Shift	> 4 Hours/Shift
	instructions to minimize dust emissions. The 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 -When used indoors or in an enclosed area	None APF 10	APF 10 APF 10
Hand-held grinders for mortar removal (i.e., tuckpointing) 	Use a grinder equipped with a commercially available shroud and dust collection system. The 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.	APF 10	APF 10
Hand-held grinders for uses other than mortar removal 	For tasks performed outdoors only: Use a grinder equipped with an integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use a grinder equipped with a commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None

Equipment / Task	Controls	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 Hours/Shift	> 4 Hours/Shift
	The 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: -When used outdoors -When used indoors or in an enclosed area	None None	None APF 10
Walk-behind milling machines and floor grinders 	Use a machine equipped with an integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use a machine equipped with a dust collection system recommended by the manufacturer. The 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.	None None	None None
Small drivable milling machines **(less than half-lane)** 	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None

Equipment / Task	Controls	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 Hours/Shift	> 4 Hours/Shift
Large drivable milling machines (half-lane and larger) 	For cuts of any depth on asphalt only: Use a machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions.	None	None
	For cuts of four inches in depth or less on any substrate: Use a machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions. OR Use a machine equipped with a supplemental water spray designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None
Crushing machines 	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station.	None	None

Equipment / Task	Controls	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 Hours/Shift	> 4 Hours/Shift
Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials. 	Operate equipment from within an enclosed cab.	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
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

TWA_{8e}- equivalent 8-hr exposure time-weighted average

OSHA Controlling Silica Dust in Construction Videos

APPENDIX B -CRYSTALLINE SILICA EXPOSURE CONTROL WORK PLAN TEMPLATE FOR WORK WITH SILICA-CONTAINING MATERIALS

----------See next page----------

Crystalline Silica Exposure Control Work Plan

A Crystalline Silica Exposure Control Plan is required when respirable crystalline silica exposure is assumed or known to be at or above 25 µg/m^{3}TWA$_{8e}$ of respirable crystalline silica in air.

Department	**Location (building, room)**
Description of work	**Work Order #**

Project schedule	Expected start date:	Expected completion date:
How long will crystalline silica-containing material be disturbed?	☐ **≤ 4 hr./shift**	☐ **> 4 hr./shift**

- **Workers must read and understand this Crystalline Silica Exposure Control Work Plan and be trained in crystalline silica work practices and the systems and equipment that will be used.**
- **Retain this Crystalline Silica Exposure Control Work Plan at the worksite for the duration of work activities.**
- **If any of the project conditions change, revise the exposure control work plan to address the changes.**
- **Additional hazards unrelated to crystalline silica must be assessed and controlled – contact EH&S or your department safety representative for assistance.**

1. Tools and equipment used to disturb crystalline silica-containing material

WAC 296-840 Table 1 equipment

☐	Stationary masonry saw	☐	Vehicle-mounted drilling rig	☐	Large drivable milling machine (half-lane and larger)
☐	Hand-held saw	☐	Jackhammers and hand-held powered chipping tools		
☐	Hand-held power saw (fiber cement board)	☐	Hand-held grinders for mortar removal	☐	Crushing machine
☐	Walk-behind saw				
☐	Drivable saw	☐	Hand-held grinder (other than mortar removal)	☐	Heavy equipment/utility vehicle (hoe-ram, rock ripping) used to abrade/fracture/demo
☐	Rig-mounted core saw or drill				
☐	Hand-held and stand-mounted drill	☐	Walk-behind milling machine and floor grinders	☐	Heavy equipment/utility vehicle for grading and excavating
☐	Dowel drilling rig	☐	Small drivable milling machine (less than half-lane)	☐	Stationary masonry saw

Non – WAC Table 1 equipment

☐	Sledgehammer	☐	Other:
☐	Mechanical sieve		
☐	Manual sieve		

2. Precautions for warning and protecting building occupants and others

☐ Work area secured	☐ Signage	☐ Building coordinator notified
☐ Plastic barriers in place	☐ Ventilation diffusors/grills covered	☐ Danger tape
☐ Other:		

3. Exposure controls and work practices to minimize worker exposures

☐ Integrated water delivery system	☐ HEPA dust collection system (grinders need 25 cfm or greater per inch of wheel diameter)	☐ Negative pressure enclosure
☐ Negative air machine	☐ HEPA vacuum cleaner	☐ Water hose
☐ Exhaust ventilation	☐ Enclosed cab or booth (See WAC 296-840-110)	☐ Dust collector/HEPA vacuum tool attachment
☐ Outdoors only	☐ Other:	

4. Personal protective equipment

☐ HEPA respirator ☐ Half-face ☐ Full-face ☐ PAPR ☐ N95 ☐ Other:	☐ Disposable gloves ☐ Disposable hoods ☐ Safety glasses ☐ Safety goggles ☐ Face shield	☐ Hearing protection ☐ Disposable coveralls ☐ Shoe covers ☐ Hard hat ☐ High visibility clothing

5. Air monitoring

☐ WAC Table 1 (no monitoring needed)	☐ Previous air monitoring has shown that employee exposures are below the Action Level and PEL for this task.
☐ Arranged with EH&S (No initial NEA)	

6. Employee(s) trained to work under this plan (attach additional sheets if necessary)

Name	Employee number	Current training (within last year)			
		☐	Respirable crystalline silica	☐	Respiratory protection
		☐	Respirable crystalline silica	☐	Respiratory protection
		☐	Respirable crystalline silica	☐	Respiratory protection
		☐	Respirable crystalline silica	☐	Respiratory protection

7. Clean-up and wash-up procedures	
Work Area:	
☐ Wet cleaning	**No Compressed Air Cleaning**
☐ HEPA vacuuming	**No Dry Sweeping**
☐ Other:	
Personnel:	
☐ Water	
☐ Soap	
☐ Clean towels	
☐ Other:	

8. Waste disposal	
☐	Consult with EH&S Environmental Programs (contact: chmwaste@uw.edu) for waste disposal determination for contaminated crystalline silica waste.

9. I certify that all required precautions including, but not limited to, wearing of proper protective equipment and clothing, participation in a medical surveillance program if necessary, and the procedures referenced above will be followed during this project. These employees have received appropriate training in the tasks to be performed and understand the risks associated with working with crystalline silica-containing material.		
Name of project manager, supervisor, or lead	**Signature**	**Date**
10. Reviewed by Competent Person (name)*		

*Project manager, supervisor, or lead may also be the Competent Person, if they meet the definition of a Competent Person.

THIS EXPOSURE CONTROL WORK PLAN MUST BE AVAILABLE AT THE JOB SITE.

APPENDIX C – OCCUPATIONAL AND ENVIRONMENTAL MEDICINE CLINIC – CRYSTALLINE SILICA EXPOSURE MEDICAL SURVEILLANCE EXAMINATION FORM

----------See next page----------

OCCUPATIONAL AND ENVIRONMENTAL MEDICINE CLINIC
CRYSTALLINE SILICA EXPOSURE MEDICAL SURVEILLANCE EXAMINATION

GENERAL MEDICAL EVALUATION QUESTIONNAIRE (*per WAC 296-842-22005*)

PART 1. EMPLOYEE BACKGROUND INFORMATION
(*All employees must complete this part*)

1. TODAY'S DATE (*YYYY-MM-DD*):	2. NAME (*Last, First, Middle Initial*):		
3. DATE OF BIRTH (*YYYY-MM-DD*):	4. SEX: ☐ Male ☐ Female ☐ Other	5. HEIGHT (*Ft, In*):	6. WEIGHT (*Lbs*):
7. JOB TITLE	8. PHONE NUMBER (*Where you can be reached by the health care professional who reviews this questionnaire (include Area Code)*) 9. BEST TIME TO CALL YOU AT THIS NUMBER:		

10. Has your employer told you how to contact the health care professional who will review this questionnaire?
☐ Yes
☐ No

11. Check the type of respirator(s) you will be using (*check all that apply*):

- ☐ N, R, or P filtering-facepiece respirator (for example an N95 filtering-facepiece respirator).
- ☐ Half mask
- ☐ Full facepiece mask
- ☐ Helmet or hood
- ☐ Escape
- ☐ Non-powered cartridge or canister
- ☐ Powered air-purifying cartridge respirator (PAPR)
- ☐ Supplied air or Air-line
- ☐ Self-contained breathing apparatus (SCBA):
  - ☐ Demand, or
  - ☐ Pressure demand
- ☐ Other (*Please specify*):

12. Have you previously worn a respirator?
☐ Yes
☐ No
If "Yes" describe what type(s):

13. Which type of medical surveillance examination are you here for?
☐ Initial
☐ Periodic
☐ Other (*Please specify*):

PART 2. GENERAL HEALTH INFORMATION
(*All employees must complete this part. Please select "Yes" or "No"*)

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month?	☐ Yes	☐ No
2. Have you *ever* had any of the following conditions?		
a. Seizures (epileptic fits)	☐ Yes	☐ No
b. Diabetes (sugar disease)	☐ Yes	☐ No
c. Allergic reactions that interfere with your breathing	☐ Yes	☐ No
d. Claustrophobia (fear of closed-in spaces)	☐ Yes	☐ No

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e. Trouble smelling odors	☐	Yes	☐	No
3. Have you *ever* had any of the following pulmonary or lung problems?				
a. Asbestosis	☐	Yes	☐	No
b. Asthma	☐	Yes	☐	No
c. Chronic bronchitis	☐	Yes	☐	No
d. Emphysema	☐	Yes	☐	No
e. Pneumonia	☐	Yes	☐	No
f. Tuberculosis	☐	Yes	☐	No
g. Silicosis	☐	Yes	☐	No
h. Pneumothorax (collapsed lung):	☐	Yes	☐	No
i. Lung cancer	☐	Yes	☐	No
j. Broken ribs	☐	Yes	☐	No
k. Any chest injuries or surgeries	☐	Yes	☐	No
l. Any other lung problem that you have been told about	☐	Yes	☐	No
4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?				
a. Shortness of breath	☐	Yes	☐	No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline	☐	Yes	☐	No
c. Shortness of breath when walking with other people at an ordinary pace of level ground	☐	Yes	☐	No
d. Have to stop for breath when walking at your own pace on level ground	☐	Yes	☐	No
e. Shortness of breath when washing or dressing yourself	☐	Yes	☐	No
f. Shortness of breath that interferes with your job	☐	Yes	☐	No
g. Coughing that produces phlegm (thick sputum)	☐	Yes	☐	No
h. Coughing that wakes you early in the morning	☐	Yes	☐	No
i. Coughing that occurs mostly when you are lying down	☐	Yes	☐	No
j. Coughing up blood in the last month	☐	Yes	☐	No
k. Wheezing	☐	Yes	☐	No
l. Wheezing that interferes with your job	☐	Yes	☐	No
m. Chest pain when you breathe deeply	☐	Yes	☐	No
n. Any other symptoms that you think may be related to lung problems	☐	Yes	☐	No
5. Have you *ever* had any of the following cardiovascular or heart problems?				
a. Heart attack	☐	Yes	☐	No
b. Stroke	☐	Yes	☐	No
c. Angina	☐	Yes	☐	No
d. Heart failure	☐	Yes	☐	No
e. Swelling in your legs or feet (not caused by walking)	☐	Yes	☐	No
f. Heart arrhythmia (heart beating irregularly)	☐	Yes	☐	No
g. High blood pressure	☐	Yes	☐	No
h. Any other heart problem that you have been told about	☐	Yes	☐	No
6. Have you *ever* had any of the following cardiovascular or heart symptoms?				
a. Frequent pain or tightness in your chest	☐	Yes	☐	No
b. Pain or tightness in your chest during physical activity	☐	Yes	☐	No
c. Pain or tightness in your chest that interferes with your job	☐	Yes	☐	No
d. In the past 2 years, have you noticed your heart skipping or missing a beat	☐	Yes	☐	No
e. Heartburn or indigestion that is not related to eating	☐	Yes	☐	No
f. Any other symptoms that you think may be related to heart or circulation problems	☐	Yes	☐	No

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7. Do you *currently* take medication for any of the following problems?		
a. Breathing or lung problems	☐ Yes	☐ No
b. Heart trouble	☐ Yes	☐ No
c. Blood pressure	☐ Yes	☐ No
d. Seizures (epileptic fits)	☐ Yes	☐ No
If you have used a respirator, have you *ever* had any of the following problems? (*If you have never used a respirator, check the following box and go to question 9*)	☐ I have never used a respirator	
e. Eye irritation	☐ Yes	☐ No
f. Skin allergies or rashes	☐ Yes	☐ No
g. Anxiety	☐ Yes	☐ No
h. General weakness or fatigue	☐ Yes	☐ No
i. Any other problem that interferes with the use of a respirator?	☐ Yes	☐ No
8. Would you like to talk with the health care professional who will review this questionnaire about your answers?	☐ Yes	☐ No
9. Have you ever had any of the following autoimmune or rheumatologic conditions?		
a. Lupus	☐ Yes	☐ No
b. Rheumatoid arthritis	☐ Yes	☐ No
c. Systemic sclerosis	☐ Yes	☐ No
d. Any other autoimmune or rheumatologic condition	☐ Yes	☐ No
10. Have you *ever* had kidney disease or kidney failure?	☐ Yes	☐ No
PART 3. ADDITIONAL QUESTIONS FOR USERS OF FULL-FACEPIECE RESPIRATORS OR SCBAs (*Please select "Yes" or "No"*)		
1. Have you *ever* lost vision in either eye (temporarily or permanently)?	☐ Yes	☐ No
2. Do you *currently* have any of these vision problems?		
a. Need to wear contact lenses	☐ Yes	☐ No
b. Need to wear glasses	☐ Yes	☐ No
c. Color blindness	☐ Yes	☐ No
d. Any other eye or vision problem	☐ Yes	☐ No
3. Have you *ever* had injury to your ears, including a broken ear drum?	☐ Yes	☐ No
4. Do you *currently* have any of these hearing problems?		
a. Difficulty hearing	☐ Yes	☐ No
b. Need to wear a hearing aid	☐ Yes	☐ No
c. Any other hearing or ear problem	☐ Yes	☐ No
5. Have you *ever* had a back injury?	☐ Yes	☐ No
6. Do you *currently* have any of the following musculoskeletal problems?		
a. Weakness in any of your arms, hands, legs or feet	☐ Yes	☐ No
b. Back pain	☐ Yes	☐ No
c. Difficulty fully moving your arms and legs	☐ Yes	☐ No
d. Pain or stiffness when you lean forward or backward at the waist	☐ Yes	☐ No
e. Difficulty moving your head up or down	☐ Yes	☐ No
f. Difficulty moving your head side to side	☐ Yes	☐ No
g. Difficulty bending at your knees	☐ Yes	☐ No
h. Difficulty squatting to the ground	☐ Yes	☐ No
i. Difficulty climbing a flight of stairs or a ladder carrying more than 25 lbs.	☐ Yes	☐ No
j. Any other muscle or skeletal problem that interferes with using a respirator	☐ Yes	☐ No

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MEDICAL AND WORK HISTORY FOR CRYSTALLINE SILICA EXPOSURE (per WAC 296-840-135)		
PART A. MEDICAL HISTORY		
Review of Systems (Evaluating healthcare provider to complete)		
1. Review responses to previous questions in PART 2 and PART 3 of the General Medical Evaluation Questionnaire. Discuss any positive responses with the worker.		
Past Medical History (Evaluating healthcare provider to complete)		
2. Review responses to previous questions in PART 2 and PART 3 of the General Medical Evaluation Questionnaire. Discuss any positive responses with the worker.		
Medications and Allergies (Employee to complete)		
3. Are you currently taking any prescription or non-prescription medications? If "Yes", please list the medication(s) below: a. b. c. d. e. f. g. h. i. j.	☐ Yes	☐ No
4. Are you allergic to any medications? If "Yes", please list the medication(s) and nature of allergic reaction below: a. b. c. d. e. f.	☐ Yes	☐ No
Family History (Employee to complete)		
5. Were either of your natural parents told that they had any of the following lung conditions?		
a. Lung cancer	☐ Yes	☐ No ☐ Unknown
b. Tuberculosis	☐ Yes	☐ No ☐ Unknown
c. Chronic bronchitis	☐ Yes	☐ No ☐ Unknown
d. Asthma	☐ Yes	☐ No ☐ Unknown
e. Emphysema	☐ Yes	☐ No ☐ Unknown
f. Other lung condition	☐ Yes	☐ No ☐ Unknown

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6. Is your father alive?	☐ Yes	☐ No ☐ Unknown If "No": Cause of death:
7. Is your mother alive?	☐ Yes	☐ No ☐ Unknown If "No": Cause of death:
***Active and Passive Tobacco Smoke and Vaping Exposure History** (Employee to complete)*		
8. Have you *ever* smoked tobacco (e.g. cigarettes, cigars, pipes etc.) regularly? If "Yes", please answer the questions below:	☐ Yes	☐ No
a. Do you still smoke? (*As of 1 month ago*)	☐ Yes	☐ No
b. How old were you when you first started smoking tobacco regularly? (*Age in years*)	_____ years old.	
c. If you have stopped smoking tobacco completely, how old were you when you stopped? (*Age in years*)	_____ years old, OR ☐ Still smoking	
d. On the average, of the entire time you smoked how many tobacco products (e.g. cigarettes, cigars, pipes etc.) did you smoke each day?	_____ per day	
e. If you are still smoking tobacco, on average, how many of the following products do you currently smoke each day *or* each week?		
a. Cigarettes	_____ per day	_____ per week
b. Cigars, cheroots or cigarillos	_____ per day	_____ per week
c. Pipes full of tobacco	_____ per day	_____ per week
d. Water pipe sessions	_____ per day	_____ per week
9. Does your spouse or partner currently smoke tobacco?	☐ Yes	☐ No
10. Has your spouse or partner smoked tobacco in the past?	☐ Yes	☐ No
11. Are you exposed to tobacco smoke at work?	☐ Yes	☐ No
12. Have you *ever* smoked **e-cigarettes** or other **vaping devices** regularly? If "Yes", please answer the questions below:	☐ Yes	☐ No
a. Do you still use vaping devices? (*As of 1 month ago*)	☐ Yes	☐ No
b. How old were you when you first started regularly using vaping devices? (*Age in years*)	_____ years old.	
c. If you have stopped using vaping devices completely, how old were you when you stopped? (*Age in years*)	_____ years old, OR ☐ Still smoking	

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d. If you are still using vaping devices, which of the following active ingredients do you smoke?	☐ Nicotine ☐ Marijuana ☐ Other (please specify):	
Hobbies (Employee to complete)		
13. Do you have any hobbies? If "Yes", please list your hobbies below: a. b. c. d. e. f.	☐ Yes	☐ No
Diagnostics (Employee to complete)		
14. Have you *ever* had a chest x-ray? If "Yes", please answer the questions below:	☐ Yes	☐ No
a. When did you last have a chest x-ray? (*Year*)	_____ (*YYYY*)	
b. What was the outcome of the chest x-ray?	☐ Normal	☐ Abnormal ☐ Unknown
15. Have you ever had lung function testing? If "Yes", please answer the questions below:	☐ Yes	☐ No
a. When did you last have lung function testing? (*Year*)	_____ (*YYYY*)	
b. What was the outcome of the lung function test?	☐ Normal	☐ Abnormal ☐ Unknown
16. Have you ever had a test for tuberculosis? If "Yes", please answer the questions below:	☐ Yes	☐ No
a. When do you last have a test for tuberculosis (either a skin test or a blood test)? (*Year*)	_____ (*YYYY*)	
b. What was the outcome of the test for tuberculosis?	☐ Normal	☐ Abnormal ☐ Unknown

PART B. OCCUPATIONAL (WORK) HISTORY
(*Employee to complete*)

Employer, Industry + Job title	Exposures (e.g. dust, chemicals, radiation etc.)	Personal Protective equipment used (e.g. respirator, gloves etc.)	Years Worked (*YYYY – YYYY*)
1.			
2.			
3.			
4.			

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PART B. OCCUPATIONAL (WORK) HISTORY (*Continued*)			
5.			
6.			
7.			
8.			
9.			
10.			

PART C. Risk Assessment for Latent TB Infection (*Evaluating provider to complete*)

Provider Instructions:

- Latent Tuberculosis Infection (LTBI) Testing is recommended if *any* of the eight boxes in the following risk assessment are checked.
- IGRA testing for LTBI is preferred in BCG vaccinated persons
- If LTBI test result is positive and active TB disease is ruled out, LTBI treatment is recommended.

Does the worker meet any of these criterion of have any of the following risk factors?

1. Worker is undergoing initial (baseline) medical examination per *WAC 296-840-145.*	☐ Yes	☐ No
2. Worker is a foreign-born person from a country with an elevated TB rate.	☐ Yes	☐ No
3. Worker has current or planned immunosuppression.	☐ Yes	☐ No
4. Worker has a history of close contact to someone with infectious TB disease at any time.	☐ Yes	☐ No
5. Worker has undergone recent foreign travel.	☐ Yes	☐ No
6. Worker has a diagnosis of silicosis.	☐ Yes	☐ No
7. Worker has a history of exposure to respirable silica for 25 years or more.	☐ Yes	☐ No
8. Other risk factor (*Please specify*):	☐ Yes	☐ No

PART D. Symptom Screen for Active TB Disease (*Evaluating Provider to Complete*)

Provider Instructions:

- Workers who have any of the following symptoms *may* require further evaluation for active TB disease.
- For workers with clinical circumstances that require additional evaluation for active TB disease, consider the following: chest x-ray if not already obtained, sputum AFB smears, cultures and nucleic acid amplification.

(*continued next page*)

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Does the worker have any signs and symptoms consistent with active TB disease in the lung, pleura, airways or larynx?		
a. Cough (longer than 3 weeks)	☐ Yes	☐ No
b. Coughing up blood	☐ Yes	☐ No
c. Fever	☐ Yes	☐ No
d. Night Sweats	☐ Yes	☐ No
e. Unusual fatigue	☐ Yes	☐ No
f. Weight loss (without trying)	☐ Yes	☐ No
g. Loss of appetite	☐ Yes	☐ No
h. Shortness of breath	☐ Yes	☐ No
i. Chest pain	☐ Yes	☐ No
j. Hoarseness	☐ Yes	☐ No

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