Silica Update

General Industry and Construction standards

“Controls – the good, the bad and the ugly”

Harvey Johnson, MIOSHA CET
Contents of Training

• What is Silica?

• What are the health effects of Silica exposure?

• New Silica Standard in Construction
• New Silica Standard in Gen. Industry

• Control of Silica
Given the chemical formula for silica \((\text{SiO}_2)\), it is interesting to note:

- **Oxygen** is the most abundant element in the Earth’s crust and **silicon** is the second most abundant.
- **Quartz**, the most common form of crystalline silica, is the second most common mineral on the earth’s surface.

It’s no wonder that exposures to respirable crystalline silica are widespread throughout the world.
Respirable Crystalline Silica

Part 690, Silica in Construction Sept. 2017
Part 590, Silica in General Industry June 2018
Respirable Silica is <10 μm in diameter
Respirable Crystalline Silica

Where can it be found:
- Sand
  - Concrete
  - Masonry products
  - Sandstone
  - Rock (granite, marble, basalt)
- Paint
- Abrasives
- Mortar
- Drywall
- Plaster
Exposure and Health Risks

• OSHA estimates more than 840,000 employees in construction and more than 100,000 employees in general industry are exposed to workplace silica levels that exceed the revised permissible exposure limit (PEL).

• Exposure to respirable crystalline silica has been linked to:
  • Silicosis,
  • Lung cancer,
  • Chronic obstructive pulmonary diseases (COPD), and
  • Kidney disease.
Silicosis in Michigan

• MI has tracked since 1985
• From 1985-2018, 1,200 silicosis cases have been identified through the Michigan tracking system (MSU/NIOSH/MIOSHA)
• MI averaged 64 reported cases per year from 1987-1997
• MI averaged 22 reported cases per year since 2000

• Data indicates under-reporting
Health Effects - Silica

• Early stages of the disease may go unnoticed.
• Silicosis – disabling, non-reversible & sometimes fatal lung disease.
• Other non-malignant respiratory diseases, such as chronic bronchitis.
• Lung Cancer
• Kidney disease – including nephritis & end-stage renal disease (kidneys).
• May be associated with auto-immune disorders & cardiovascular disease.

• Symptoms include:
  • Shortness of breath
  • Severe cough
  • Chest pains
  • Weakness
Definition: Respirable Crystalline Silica
Part 690, Rule 69015 (9)

- Silica is comprised of **crystalline quartz, cristobalite, and/or tridymite**.

- The **respirable fraction** (10 microns in diameter or less) is of greatest concern as these tiny, dagger-like particles have the potential to reach the delicate alveolar lung tissue.
Crystalline silica causes scar tissue inside the alveoli, blocking the transfer of gases to and from the blood.
Types of Silicosis

- Chronic
  - 10 or More Years of Exposure
  - Low Exposure Concentrations
- Accelerated
  - 5 to 10 Years After Exposure
  - High Exposure Concentrations
- Acute
  - A Few Weeks to 4 or 5 Years After Exposure
  - Highest Exposure Concentrations
Silica Exposure Limits
Part 590, 1910.1053 (c) and Part 690, 1926.1153 (d)(1)

PEL: permissible exposure limit
50 µg/m³, 8-hr TWA

AL: action limit
25 µg/m³, 8-hr TWA
Scope & Application

Part 690 (1926.1153) – Construction

This standard applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m³) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.
Silica in Construction
MIOSHA Part 690 (adopts 29 CFR 1926.1153)

Scope and application
Definitions

Specified exposure control methods,

(1) ...OR...

Alternative exposure control methods:
  ◦ Permissible exposure limit (PEL)
  ◦ Exposure assessment
  ◦ Methods of compliance

Respiratory protection
Housekeeping
Written exposure control plan
Medical surveillance
Communication of silica hazards
Recordkeeping
Dates
## Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica - Construction

<table>
<thead>
<tr>
<th>EQUIPMENT/TASK/CONTROL METHODS</th>
<th>REQUIRED RESPIRATORY PROTECTION &amp; MINIMUM ASSIGNED PROTECTION FACTOR (APF)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td><strong>1 - Stationary Masonry Saws</strong></td>
<td>None</td>
</tr>
<tr>
<td>Continuous water feed to blade</td>
<td></td>
</tr>
<tr>
<td><strong>2 - Handheld power saws (any blade diam)</strong></td>
<td></td>
</tr>
<tr>
<td>Continuous water feed to blade</td>
<td>None</td>
</tr>
<tr>
<td>- Outdoors</td>
<td></td>
</tr>
<tr>
<td>- Indoors/enclosed area</td>
<td>APF 10</td>
</tr>
<tr>
<td><strong>3 - Handheld power saws for cutting fiber cement board (blade diameter ≤ 8 inches)</strong></td>
<td>None</td>
</tr>
<tr>
<td>- Outdoor use only</td>
<td></td>
</tr>
<tr>
<td>- Dust collection system (commercial)</td>
<td></td>
</tr>
<tr>
<td>- Proper tool airflow &amp; filters (≥99%)</td>
<td></td>
</tr>
</tbody>
</table>
Breathing zone
20 µg/m³
Silica as quartz

Vacuum
37 µg/m³
Silica cristobalite
CONCRETE & MASONRY / CUTTING / TUCK-POINTING

**TOOL**
- 9564CV
  - 4-1/2" SJS™ High-Power Angle Grinder

**ATTACHMENT**
- 198415-4
  - 4-1/2" - 5" Dust Extraction Cutting Guard

**ADAPTER**
- 417765-1
  - Tool Cuff Adapter, 22mm for 1" hose (Included with XCV04Z)

**HOSE**
- 195433-3
  - Anti-Static Hose 1" x 11' (Included with XCV04Z)

**EXTRACTOR**
- XCV04Z
  - 18V X2 LXT® (36V) 2.1 Gallon HEPA Filter Dry Dust Extractor/Vacuum
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<tbody>
<tr>
<td>4 - Walk-behind saws</td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>◦ Continuous water feed to blade</td>
<td>None</td>
</tr>
<tr>
<td>◦ Outdoors</td>
<td>None</td>
</tr>
<tr>
<td>◦ Indoors/enclosed area</td>
<td>APF 10</td>
</tr>
<tr>
<td>5 - Drivable saws</td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>◦ Outdoors only</td>
<td>None</td>
</tr>
<tr>
<td>◦ Continuous water feed to blade</td>
<td>None</td>
</tr>
<tr>
<td>6 - Rig-mounted core saws/drills</td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>◦ Continuous water feed to blade</td>
<td>None</td>
</tr>
<tr>
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<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>7 - Handheld &amp; Stand-mounted drills (include impact/rotary hammer drills)</strong></td>
<td></td>
</tr>
<tr>
<td>◦ Shroud/cowling equipped drill</td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>◦ <strong>Dust</strong> collection ≥99% w/ filter cleaning mechanism</td>
<td>≥ 4 hours/shift</td>
</tr>
<tr>
<td>◦ HEPA filtered vac for cleaning holes</td>
<td></td>
</tr>
<tr>
<td><strong>8 - Dowel drilling rigs for concrete</strong></td>
<td>APF 10</td>
</tr>
<tr>
<td>◦ <strong>Outdoors only</strong></td>
<td></td>
</tr>
<tr>
<td>◦ Shroud/cowling around drill bit</td>
<td></td>
</tr>
<tr>
<td>◦ <strong>Dust</strong> collection ≥99% w/ filter cleaning mechanism</td>
<td></td>
</tr>
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<td>-------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td></td>
<td>≥ 4 hours/shift</td>
</tr>
<tr>
<td>• 9- Vehicle-mounted drilling rigs for rock/concrete</td>
<td>None</td>
</tr>
<tr>
<td>• Dust collection system w/ close capture hood/shroud around drill bit w/ low-flow water spray to wet dust at discharge point from dust collector</td>
<td>None</td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>• Operate from within an enclosed cab and use water for dust suppression on drill bit</td>
<td>None</td>
</tr>
</tbody>
</table>

Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica
Dust shrouds protect drillers
## Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

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<tbody>
<tr>
<td>◦ 10 - Jackhammers &amp; handheld power chipping tools</td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>◦ Continuous stream/spray of water at point of impact</td>
<td>None</td>
</tr>
<tr>
<td>◦ When used outdoors</td>
<td></td>
</tr>
<tr>
<td>◦ Indoors/enclosed areas</td>
<td>APF 10</td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>◦ Equipped w/ commercially available shroud &amp; dust collection system</td>
<td></td>
</tr>
<tr>
<td>◦ Filter w/ ≥ 99% filter w/ filter- cleaning mechanism</td>
<td>None</td>
</tr>
<tr>
<td>◦ When used outdoors</td>
<td></td>
</tr>
<tr>
<td>◦ Indoors/enclosed areas</td>
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<tbody>
<tr>
<td></td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>11- Handheld grinders for mortar removal (i.e., tuckpointing)</td>
<td></td>
</tr>
<tr>
<td>◦ Equipped w/ commercially available shroud &amp; dust collection</td>
<td>APF 10</td>
</tr>
<tr>
<td>◦ Dust collector must provide ≥ 25 cfm per inch of wheel diameter</td>
<td></td>
</tr>
<tr>
<td>◦ Filter w/ ≥ 99% efficiency</td>
<td></td>
</tr>
<tr>
<td>◦ Cyclonic pre-separator or filter-cleaning mechanism</td>
<td></td>
</tr>
</tbody>
</table>
Worker grinding concrete using a HEPA vacuum exhaust attachment on the grinder.
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</thead>
<tbody>
<tr>
<td><strong>12 - Handheld grinders for uses other than mortar removal</strong></td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>◦ Performed outdoors only</td>
<td>None</td>
</tr>
<tr>
<td>◦ Equipped w/ integrated <strong>water</strong> delivery system for continuous water feed to the grinding surface</td>
<td>None</td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>◦ Equipped w/ commercial shroud &amp; <strong>dust</strong> collection</td>
<td></td>
</tr>
<tr>
<td>◦ Dust collector must provide ≥ 25 cfm of airflow per inch of wheel diameter</td>
<td></td>
</tr>
<tr>
<td>◦ Filter w/ ≥ 99% efficiency</td>
<td></td>
</tr>
<tr>
<td>◦ Use cyclonic pre-separator or filter cleaning mechanism</td>
<td>None</td>
</tr>
<tr>
<td>◦ When used outdoors</td>
<td>None</td>
</tr>
<tr>
<td>◦ Indoors/enclosed areas</td>
<td>None</td>
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<tbody>
<tr>
<td>13- Walk-behind milling machines &amp; floor grinders</td>
<td>≤ 4 hours/shift</td>
</tr>
<tr>
<td>◦ Equipped w/ integrated water delivery system</td>
<td>None</td>
</tr>
<tr>
<td>◦ Continuous water feed to cutting surface</td>
<td></td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>◦ Equipped w/ dust collection system recommended by Mfg.</td>
<td>None</td>
</tr>
<tr>
<td>◦ Dust collection must provide air flow ≥ recommended by Mfg</td>
<td></td>
</tr>
<tr>
<td>◦ Filter ≥ 99% efficiency (HEPA)</td>
<td></td>
</tr>
<tr>
<td>◦ Filter-cleaning mechanism</td>
<td></td>
</tr>
<tr>
<td>◦ Indoors/enclosed areas – HEPA vac to remove loose dust between passes</td>
<td></td>
</tr>
</tbody>
</table>
Respiratory Protection

Respiratory Protection is required:

- Where specified by Table 1.
- Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls.
- Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible.
- 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.

The employer shall establish and implement a written exposure control plan that contains at least the following elements:

- Description of:
  - Tasks with respirable silica exposure
  - Control measures, etc.
  - Housekeeping measures
  - Procedures use to restrict access to work areas (construction only).
Review the plan annually; update as necessary.

Make the plan readily available.
Silica Written Exposure Control Plan - Sample

Company: ___________________________ Date: ___________________________

Person Completing the Plan, Title: ___________________________

Competent Person: ___________________________

Job site/location: ___________________________

Description of Task: ___________________________

(Routine task, new task, indoors/outdoors, task found on Table 17)

☐ Part 590, 1910.1053 General Industry (References Table 1)
  - review necessary? Y or N

☐ Part 690, 1926.1153 Construction (Includes Table 1)
  - review necessary? Y or N

Engineering Controls: ___________________________

Any deviation from Table 1 = air monitoring is required. Engineering controls must be used at all times!
(Wet methods, continuous water feed, local exhaust ventilation w/HEPA filters, commercially available shrouds, commercial dust collection systems, cyclone pre-separator/filter cleaning system, surfactant used, and ventilation ≤ 25 cfm/inch of wheel diameter, enclosed cab w/ fresh climate controlled air to operator, employees outside of cab applying water/dust suppressants, equipment maintained to minimize dust emissions.)

Work Practices: ___________________________

(Maintain equipment functionality – cleaning/space filters, hoses to start, good connections, hoses with no holes, kinks, permanent bends, crushed; power source available; water source available, ensure ventilation is ≥ 25 cfm/inch of wheel diameter, water/exhaust ventilation lines safe from damage; shrouds/cowl fit correctly and not damaged; follow Manufacturer’s instruction for filter cleaning/change out.)

Respiratory protection: ___________________________

(e.g. Use respirator with APF ≥ 10 the entire time the task is being performed – See Table 1)

See Part 451 – Respiratory Protection rule (1910.134) for information on selection, training and fit testing requirements, and proper use instruction for respirators (e.g., no facial hair interfering with the respirator sealing surface).

Housekeeping: ___________________________

(Dust containing silica on work surfaces[equipment must be cleaned up using wet methods or HEPA equipped vacuum. Use of compressed air or dry sweeping for removing dust and debris containing silica, dispose of used vacuum bags in a closed sealed container].)

Procedures Used to Restrict Access to Work Area (Construction = required, CI = optional): ___________________________

(Signage, barricades, enclosures, spotters, work when area is cleared of other contractors to reduce risk of exposure.)

Objective data use (Optional) – Yes or NO

Data Source: ___________________________

Data conditions from the source exactly matches the work conditions? Yes or No
(Same conditions, equipment, process, controls, material silica %, environmental.)

Review this plan with all involved employees.

Keep a copy of this plan at the jobsite.

Provide this plan of action to the General Contractor.

Review and update annually.

Additional Notes: ___________________________

LARA is an equal opportunity employer.}

Consultation Education & Training (CET) Division
625 West Allis Avenue • P.O. Box 38939 • Lansing, MI 48003-8939
www.michigan.gov/cet • (517) 334-4700
(Revised 04/19)
The employer shall designate a competent person to:

1. Make frequent and regular inspections of job sites, materials, and equipment to...

2. Implement the written exposure control plan.
Definition: Competent Person
Part 690, Rule 69015 (4)

Capable of identifying existing and foreseeable respirable crystalline silica hazards.

Has authorization to take prompt corrective measures to eliminate or minimize identified hazards.

Has the knowledge and ability necessary to fulfill the responsibilities set forth in the written exposure control plan section of the standard: 1926.1153 (g)

Makes frequent and regular inspection of job sites, materials, and equipment
Housekeeping – Dry Sweeping/Brushing
Part 690, 1926.1153 (f)(1)

The employer shall 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.

Burden on employer to prove infeasibility

Note: using sweeping compounds (e.g. non-grit or wax-based) is acceptable dust suppression housekeeping method.
The employer shall 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:

- The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air;
- OR
- No alternative method is feasible.
Baseline within 30 days after initial assignment:

Employers must *make available* medical examinations to *workers required to wear a respirator* for *30 or more days a year.*
Medical Surveillance
Part 690, 1926.1153 (h)

**FREQUENCY and CONTENT:**

Employers must **offer examinations every three years** to workers who continue to be exposed above the trigger.

**Exam includes:** medical and work history, physical exam, chest X-ray, and pulmonary function test, TB test (on initial exam only), and any other test deemed appropriate by the PLHCP.
Medical Surveillance
Part 690, 1926.1153 (h)

Worker receives report with detailed medical findings.

Employer receives an opinion that only describes limitations on respirator use, and if the worker gives written consent, recommendations on:

- Limitations on exposure to respirable crystalline silica, and/or
- Examination by a Specialist.
HAZARD COMMUNICATION

Include respirable crystalline silica

Access to labels on containers of crystalline silica and safety data sheets, and is trained in accordance with the provisions of HCS and Part 690.

Ensure that at least the following hazards are addressed: cancer, lung effects, immune system effects, and kidney effects.
Communication of Silica Hazards – Info/Train
Part 690, 1926.1153 (i)

Each employee shall demonstrate knowledge and understanding of:

- **Health hazards** associated with exposure to respirable crystalline silica;
- Specific **tasks in the workplace** that could result in exposure to respirable crystalline silica;
- Specific **measures the employer has implemented** to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used;
- **Contents of MIOSHA Part 690**;
- **Identity of the competent person** designated by the employer
- **Purpose and a description of the medical surveillance program**.
Recordkeeping
Part 690, 1926.1153 (j)

Make and maintain accurate records:
- Air monitoring data,
- Objective data, **AND**
- Medical records.

Content of records specified by the standard.
No local ventilation/water control

Water/Local ventilation being used
Respirable Crystalline Silica

- PART 590, SILICA IN GENERAL INDUSTRY
Silica in G.I.
MIOSHA Part 590 (adopts 29 CFR 1910.1052)

Scope and application

Definitions

Permissible exposure limit (PEL)

Exposure assessment
○ <AL – done
○ >AL – PEL – repeat ea. 6 months
○ >PEL - repeat ea. 3 months

Regulated areas

Engineering & Work pract. CONTROLS

Exposure Control Plan

Respiratory protection

Housekeeping

Written exposure control plan

Medical surveillance

Communication of silica hazards

Recordkeeping
Exposure assessment – G.I.

**General Industry**

**(d)(1) General.** The employer shall 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 paragraph (d)(2) or the scheduled monitoring option in paragraph (d)(3) of this section.

**(2) Performance option.** The employer shall assess the 8-hour TWA exposure 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.

**(3) Scheduled monitoring option.** (i) The employer shall perform initial monitoring to assess the 8-hour TWA exposure for each employee on the basis of one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification, in each work area. Representative sampling is acceptable, must sample employees who are expected to have the highest exposure to respirable crystalline silica.
Exposure Assessment – G.I.

- (ii) If initial monitoring < A.L. (25 µg/m³), employer may discontinue monitoring of the represented employees for that exposure.

- (iii) Where the most recent exposure monitoring ≥ A.L. but ≤ PEL (50 µg/m³), the employer shall repeat such monitoring within six months of the most recent monitoring.

- (iv) Where the most recent exposure monitoring > PEL, repeat monitoring within 3 months of the most recent.

- (v) Where the most recent (non-initial) exposure monitoring < A.L., employer shall repeat such monitoring within 6 months of the most recent monitoring until 2 consecutive measurements, taken 7 or more days apart, are < A.L., employer may discontinue monitoring for those employees represented by such monitoring, except as otherwise provided in paragraph (d)(4) of this section.

- (4) Reassessment of exposures. The employer shall 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 A.L., or when the employer has any reason to believe that the new or additional exposures at or above the A.L. have occurred.
Employee Notification of Assessment Results

Within 15 working days after completing an exposure assessment;

- Employer shall individually notify each affected employee in writing of the results.
- Employer can post results in appropriate location accessible to all affected employees.
- If exposures exceed the PEL, the employer shall describe in writing the corrective action being taken to reduce exposures.

Observation of monitoring

- Affected employees or their designated reps have the option to observe the air monitoring.
- Observers must comply with the PPE requirements of the area.
Regulated Areas

**Establishment** – The employer shall 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.

**Demarcation** – The employer shall demarcate areas from the rest of the workplace in a manner that minimizes the number of employees exposed to silica within the regulated area.

- The employer shall post signs at all entrances to regulated areas that bear the legend specified in paragraph (j)(2) of this section.

**Access** – The employer shall limit access to regulated areas to:

- Persons authorized and required by work duties to be present.
- Designated representatives exercising the right to observe.
- Any person authorized by the Occupational Safety and Health Act
Methods of Compliance

Engineering & Work Practice Controls (by June 2021)
- The employer shall use engineering and work practice controls to reduce and maintain employee exposures to or below the PEL – unless determined to be not feasible.
- Employer must use engineering controls regardless of feasibility.
- Employer will supplement engineering controls with respiratory protection.

Written Exposure Control Plan
- The employer shall establish and implement a written exposure control plan that contains at least the following:
  - A description of the tasks in the workplace that involve exposure to respirable crystalline silica.
  - A description of engineering controls, work practices, and respiratory protection used to limit exposures to silica.
  - A description of the housekeeping measures used to limit employee exposures.
  - The Written Exposure Control Plan shall be review and evaluated annually
  - The Written Exposure Control Plan shall be readily available for review and copy.
Respiratory Protection


Respiratory Protection is required:

- **Where exposures exceed the PEL** during periods necessary to install or implement feasible engineering and work practice controls.
- Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible.
- 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.
- During periods when the employee is in a regulated area.
Housekeeping

The employer shall not allow dry sweeping or dry brushing where such activity could contribute to employee exposure unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure is not feasible.

- The employer shall not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to employee exposures unless;
  - The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air; or
  - No alternative method is feasible.
Medical Surveillance

**General** – The employer **shall** make medical surveillance available at no cost, at a reasonable time and place, for each employee who will be occupationally exposed to silica **at or above the action level for 30 days or more per year.**

- Performed by a PLHCP.
- Initial exam within 30 days of assignment or last 3 years if the exams were the same requirements.

**The exam will consist of:**

- In-depth medical and work history (past, present, anticipated – silica exposures, other respiratory agents, respiratory dysfunction, TB and smoking history).
- Physical exam – special emphasis on the respiratory system.
- Chest x-rays – specific requirements see std.
- Pulmonary function test
- Testing for latent TB infection.
- Any other tests deemed appropriate by the PLHCP.
Signs

The employer shall post signs at all entrances to regulated areas that bear the following legend:

Danger
Respirable Crystalline Silica
Causes Damage to Lungs
Wear Respiratory Protection In This Area
Authorized Personnel Only
Employee Information & Training

The employer **shall** ensure that each employee covered by this section can demonstrate knowledge and understanding of at least the following:

- Health hazards associated with silica exposure.
- Specific tasks in the workplace that could result in silica exposure.
- Specific measures the employer has implemented to protect employees from silica exposures.
  - Engineering Control
  - Work Practices
  - Respiratory Protection Used
- The contents of this section of the silica standard.
- The purpose and a description of the medical surveillance program required.
- The employer **shall** make a copy of this section readily available without cost to each employee covered.
QUESTIONS?

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