

# New Silica Standard

1926.1153  
1910.1053



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## What is Silica?

What?

- Silicon dioxide (SiO<sub>2</sub>)
- Major component of sand, rock & mineral ores



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## What Industries Impacted?

**Manufacturing:** Foundries, Abrasive blasting, Paint, Glass, Concrete, Brick making, Plumbing fixtures, Refractory

**Construction:** highway, masonry, concrete, rock drilling

**Construction tasks:** masonry saws, grinders, drills, jackhammers and handheld powered chipping tools; vehicle-mounted drilling rigs; milling; operating crushing machines; and heavy equipment for demolition.

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# Silicosis

Most common occupational lung disease worldwide

Irreversible fibrotic lung disease

Three types:

- Chronic
- Accelerated
- Acute

Can still occur after exposure ends




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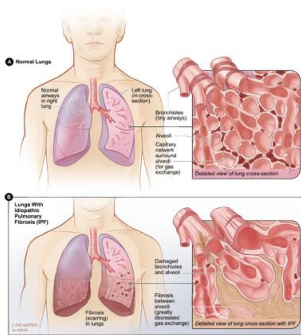
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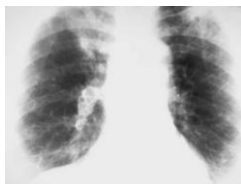
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# Silica Health Hazards

- Silicosis
- Chronic Obstructive Pulmonary Disease (COPD)
- Tuberculosis (TB)
- Lung Cancer
- Kidney disease
- Autoimmune conditions




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## Crystalline Silica PEL/AL

PERMISSIBLE  
EXPOSURE LEVEL

0.050 mg/m<sup>3</sup> or  
50 µg/m<sup>3</sup> 8-hour  
TWA



ACTION LEVEL

0.025 mg/m<sup>3</sup> or  
25 µg/m<sup>3</sup> 8-hour  
TWA



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## Exposure Determination



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## Exposure Determination

Objective Data  
IH Monitoring  
Utilize Table 1 (Construction Only)



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# Construction Specific Operations

An exposure assessment is NOT required if...

- Table 1 Operation
- Engineering controls implemented
- Work practices implemented
- Respiratory protection worn

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Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.  Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
(ii) Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.  Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.  - When used outdoors. - When used indoors or in an enclosed area.	None  APF 10	None  APF 10

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## Table 1 Tasks

- Saws: Stationary masonry, Handheld power, Handheld power saws for fiber cement board, Walk-behind saws, Drivable saws
- Drills: Rig-mounted core saws or drills, Handheld and stand-mounted drills, Dowel drilling rigs for concrete, Vehicle-mounted drilling rigs for rock and concrete
- Jackhammers and handheld powered chipping tools
- Grinders: Handheld grinders for mortar removal (tuckpointing), Handheld grinders for other than mortar removal,
- Milling: Walk-behind milling machines and floor grinders, Small drivable milling machines
- Large drivable milling machines
- Crushing machines
- Heavy equipment and utility vehicles to abrade or fracture silica materials and for grading and excavating

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## Exposure Assessment

### Initial assessment

- Not required if objective data of no exposure

### Periodic

- < AL Discontinue
- $\geq AL \leq PEL$  – every six months
- > PEL – every 3 months
- Performance option – assess exposure for each employee sufficient to characterize exposures

### Reassess

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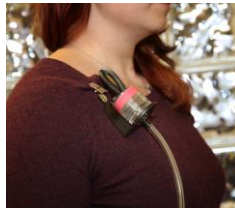
## Exposure Assessment

Assess exposure if expected to be  $\geq AL$

8-hour TWA BZ samples

Determine exposure on basis of  $\geq 1$  air samples that reflect exposures of employees

- On each shift
- For each job classification
- In each work area
- Representative sampling OK, include highest exposure




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## Sampling Methodology

OSHA ID-142; NMAM 7500, NMAM 7602, NMAM 7603, MSHA P2, MSHA P-7

- Media: 5  $\mu m$  PVC filter
- ISO CEN particle size selection
- Cyclone




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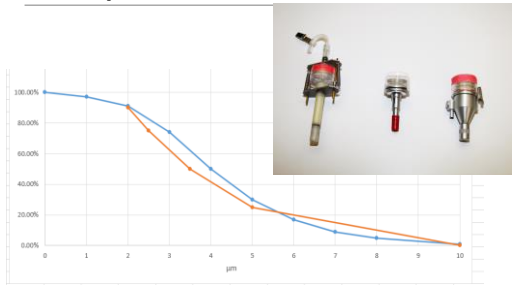
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## Respirable Dust Comparison




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## Employee Notification

Each employee affected notified within 5 working days (construction)

Each employee affected notified within 15 working days (general industry)

OR post the results for all affected employees

> PEL include corrective action

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COMPANY X  
123 Any Street  
Columbus, OH

### Employee Notification of Crystalline Silica Monitoring Results

Name: \_\_\_\_\_ Position: \_\_\_\_\_  
Site: \_\_\_\_\_ Sampling Date: \_\_\_\_\_

This letter is to notify you of the results from the inhalation exposure to respirable crystalline silica sample collected in your breathing zone on the date listed above.

All sampling results are compared to the Occupational Safety and Health Administration's Permissible Exposure Limit (OSHA PEL) and Action Level as outlined in 29 CFR 1926.1153(a). These exposures are based on an 8-hour shift.

Sample No.	Sample Time (min)	Sample Results	OSHA PEL	Action Level
			0.05 mg/m <sup>3</sup>	0.025 mg/m <sup>3</sup>

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Based on the results of the sampling, the following corrective actions will be put in place:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sample results are less than the OSHA PEL for an 8-hour shift and no corrective actions are necessary.

By signing below, you are indicating that you have been provided with the results of the respirable crystalline silica monitoring sample collected on you and the results have been explained to you. If you have any questions, please talk to your safety representative.

\_\_\_\_\_  
Employee Signature      Date      Safety Representative Signature      Date

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Observation of Monitoring

Affected employees  
Designated representatives  
PPE provided to observer

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Regulated Area and Control Plan

Regulated Area (Mfg.)	Written Access Control Plan (Manufacturing & Construction)
Exposure > PEL	Competent person ID presence/location
Demarcation	Procedures to notify and mark
Limit access	Inform other contractors
Respirators provided	Provisions to limit access
Work clothing provided if gross contamination potential	Procedures to provide respirators
	PPE
	Annual review & update
	Available

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





## Compliance

### Cleaning

- HEPA and wet methods
- Compressed air, dry sweeping and dry brushing prohibited

Employee rotation prohibited



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## Respiratory Protection

Comply with 1910.134

Usage

Written program



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## Medical Surveillance

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## Medical Surveillance

Construction: Exposed >PEL/required to wear a respirator for 30 days or more

Manufacturing: Exposed ≥AL 30 days or more per year

Initial examination within 30 days of assignment (unless exam within 3 years)

Periodic- every 3 years

Info to PLHCP

PLHCP written opinion

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## Work Information

Employer must provide to PLHCP:

- Employee's duties that may lead to silica exposure
- Silica exposure levels
- Description of PPE used
- Previous employment-related medical exam information

A standard form can be used

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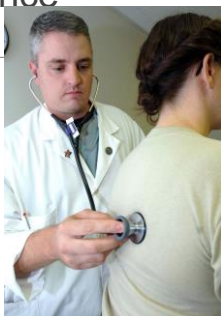
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## Medical Surveillance - Content

PLHCP

Medical and work history

- Silica exposure
- Respiratory system medical history
  - Symptoms of respiratory diseases
  - Tuberculosis exposure history
  - Smoking status/history
- Past & current medical conditions
- History of surgeries and hospitalizations
- Past & current medications



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## Medical Surveillance - Content

Physical exam

- TB test
- Lung function test

Chest x-ray

Pulmonary function test

Additional exams, as needed



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## Results and Reports

Within 30 days: provide and explain results to employee

Written medical report must contain:

- Results of examination
- Any conditions that increase employee risk
- Any conditions that may require further evaluation or treatment
- Any limitations on respirator use or exposure to silica
- Referral to a specialist as applicable

Recommended: copy of exam and test results for employee's records

Written medical opinion to employer within 30 days

- Exposure limitations and specialist referrals only with employee permission

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## Employee Information and Training

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## What do employees need to know?

- OSHA requires employees to know and understand:
- Health hazards associated with respirable crystalline silica
  - Workplace tasks that could result in exposure
  - Measures your company has put in place to protect employees
  - Who the competent person is
  - What the medical surveillance program is and its purpose

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## Hazard Communication

- Employee communication
- Labels
- SDS
- Employees demonstrate knowledge
  - Operations
  - Procedures
  - Standard
  - Medical Surveillance



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## Recordkeeping

- Training
- Air monitoring data
- Objective Data
- Medical Surveillance
  - 1910.1020



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## Effective Dates

### Manufacturing

- June 23, 2018 Program Requirements
- June 23, 2020 – Medical Surveillance Requirements
- June 23, 2021 – Hydraulic Fracturing engineering controls

### Construction

- ~~June 23, 2017~~ Program and Medical Requirements
  - September 28, 2017 (4/6/17 announcement)
  - June 23, 2018 Laboratory Analysis Compliance

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## Your Next Steps

1. Determine potential exposures
2. Conduct exposure assessments
  1. Or use Table of Control Methods and Respirators if in Construction
3. Develop written exposure control plan
4. Designate a competent person (construction)
5. Develop employee training program
6. Implement medical surveillance if required
7. Recordkeeping

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