



Keep Your Head Out of the Clouds!

Silica in General Industry and Construction

An Overview of MIOSHA Part 590 and Part 690

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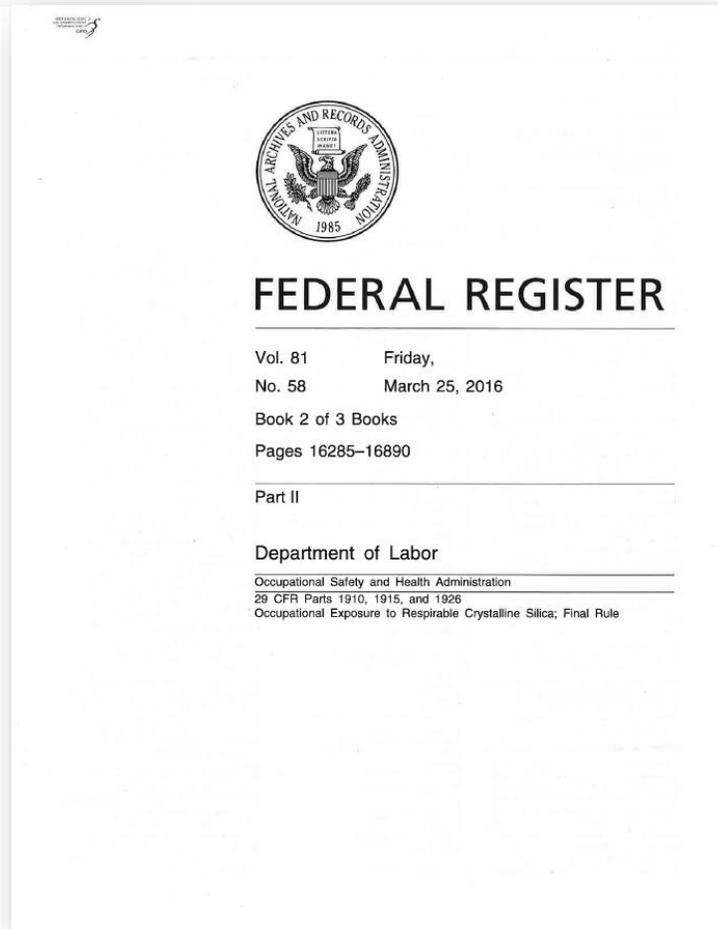
Objective

To provide an overview of MIOSHA Part 590, Silica in General Industry and MIOSHA Part 690, Silica in Construction.





New MIOSHA Silica Standards

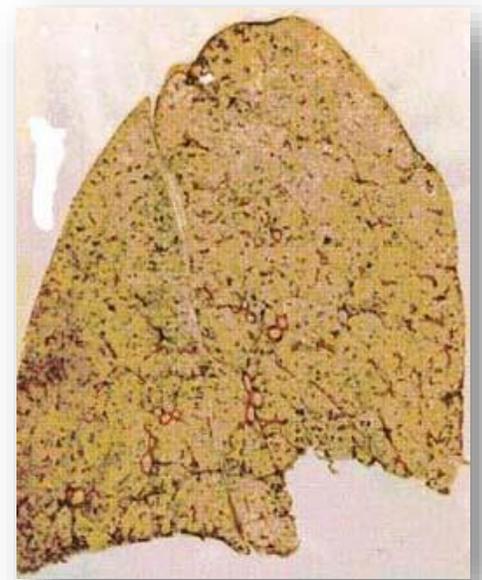


- Adopt two federal OSHA standards published in 2016.
- Impact both General Industry and Construction activities (maritime is protected by federal OSHA).
- Address employee exposures to respirable crystalline silica.
- Reasons for the new standard:
 - Current PELs do not adequately protect construction and general industry employees.
 - Extensive epidemiologic evidence that lung cancer and silicosis occur at exposure levels below $100 \mu\text{g}/\text{m}^3$.



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 PEL.**
- Exposure to respirable crystalline silica has been linked to:
 - Silicosis,
 - Lung cancer,
 - Chronic obstructive pulmonary disease, and
 - Kidney disease.



Healthy Lung



Silicotic Lung



Workers and Industries Affected Nationally

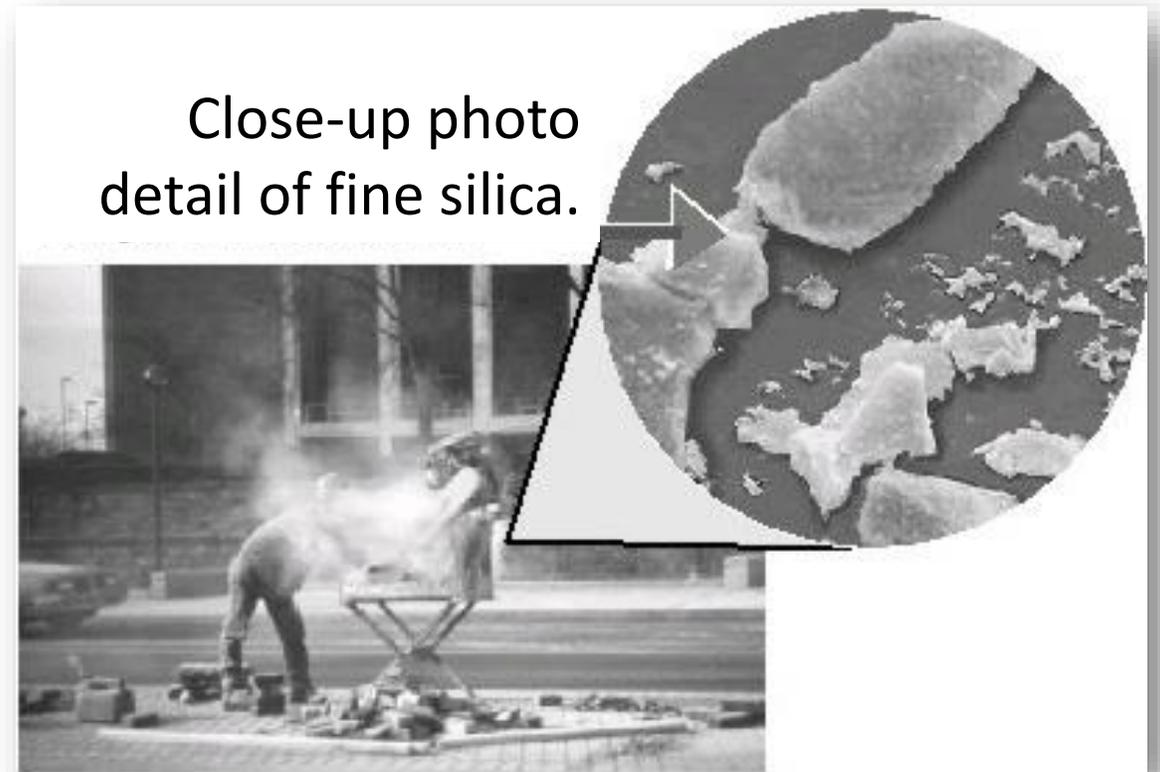
- 2.3 million workers protected:
 - Construction: 2,000,000
 - GI/Maritime: 300,000
- 676,000 establishments impacted:
 - Construction: 600,000
 - GI/Maritime: 76,000





MIOSHA Silica Standards

- Address respirable crystalline silica exposures:
- Two standards in Michigan:
 - MIOSHA Part 590, Silica in **General Industry**.
 - MIOSHA Part 690, Silica in **Construction**.
 - Maritime industry is addressed by federal OSHA.
- Adopts the federal OSHA requirements by reference.





Tasks/Activities At Risk of Exposure to Silica

Not An All-Inclusive Listing

Construction

- Using tools and heavy equipment for demolition.
- Chipping, cutting, sawing, drilling, grinding, sanding, and crushing of concrete, brick, block, rock, and stone products.
- Use of sand products.
- Use of handheld power saws without dust controls to cut concrete.

General Industry

- Asphalt Roofing Materials
- Concrete Products
- Cut Stone
- Dental Laboratories
- Foundries
- Jewelry
- Porcelain Enameling
- Pottery
- Railroads
- Ready-Mix Concrete
- Shipyards
- Structural Clay Products
- Support Activities for Oil and Gas Operations



Silica in General Industry

MIOSHA Part 590 (adopts 29 CFR 1910.1053)

- **Scope and application**
- **Definitions (11 terms)**
- Permissible exposure limit (PEL)
- Exposure assessment:
 - General
 - Performance option
 - Scheduled monitoring option
 - Reassessment of exposures
 - Methods of sample analysis
 - Employee notification of assessment results
 - Observation of monitoring
- Regulated areas
- Methods of compliance
- **Respiratory protection**
- **Housekeeping**
- **Medical surveillance**
- **“Communication of silica hazards”**
- **Recordkeeping**
- **Dates**

BOLD TEXT references similar information and content both OSHA silica standards.



Silica in Construction

MIOSHA Part 690 (adopts 29 CFR 1926.1153)

- **Scope and application**
- **Definitions (11 terms)**
- Specified exposure control methods,
...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**

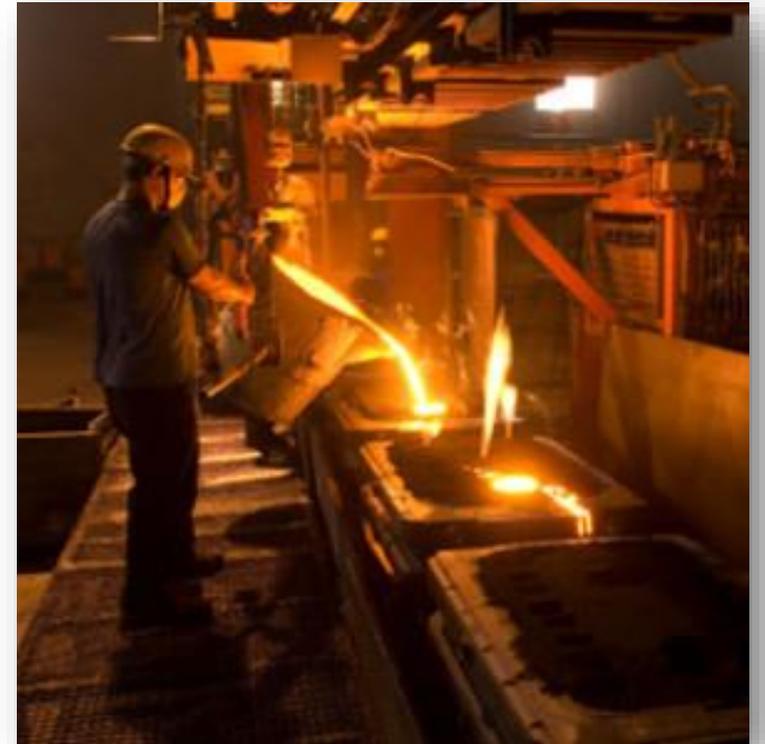
BOLD TEXT references similar information and content both OSHA silica standards.



Scope: General Industry

Part 590, Rule 59001

- ***Applies to all occupational exposures to respirable crystalline silica except: construction work, agricultural operations, and exposures that result from working with sorptive clays.***
- ***Does not apply:***
 - *Where employee exposures will remain below 25 micrograms per cubic meter of air (25 $\mu\text{g}/\text{m}^3$) as an 8-hour time weighted average (TWA) under any foreseeable conditions (objective data).*
 - *If employer complies with Part 690, the task is listed in Table 1, and will not be performed regularly in the same environment and conditions.*





Scope: Construction

Part 690, Rule 69001



- *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 ($25 \mu\text{g}/\text{m}^3$) as an 8-hour time weighted average (TWA) under any foreseeable conditions.*



Definitions

Part 590, Rule 59015 or Part 690, Rule 69015

General Industry Standard (Part 590)

1. Action level
2. Assistant Secretary
-  ~~3. **Competent person**~~
3. Director
4. Employee exposure
5. High-efficiency particulate air (HEPA) filter
-  **6. Objective data**
7. Physician or other licensed health care professional (PLHCP)
-  **8. Regulated area**
- 9. Respirable crystalline silica**
10. Specialist
11. This section

Construction Standard (Part 690)

1. Action level
2. Assistant Secretary
- 3. Competent person**
4. Director
5. Employee exposure
6. High-efficiency particulate air (HEPA) filter
- 7. Objective data**
8. Physician or other licensed health care professional (PLHCP)
- 9. Respirable crystalline silica**
10. Specialist
11. This section

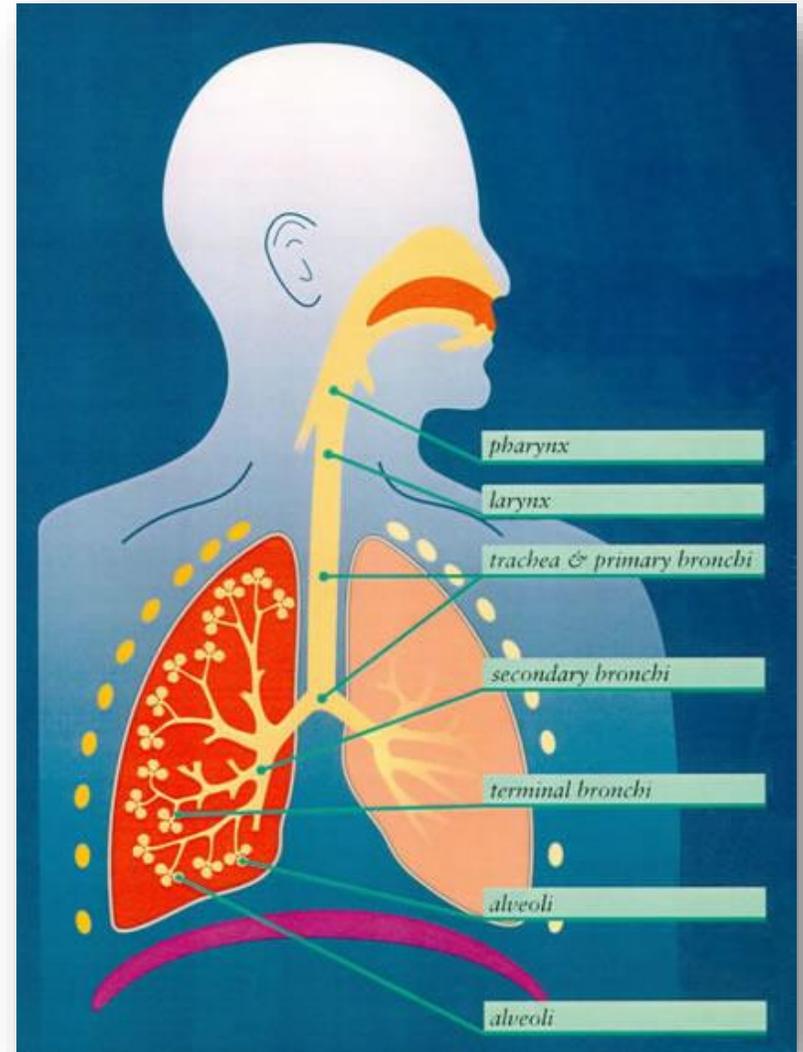
Bold text on this slide represents terms defined in this presentation.
Red stars denote errata in MIOSHA Part 590.



Definition: Respirable Crystalline Silica

Part 590, Rule 59015 (9) and 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**.





Definition: Objective Data

Part 590, Rule 59015 (7) and Part 690, Rule 69015 (7)

- ***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.***



Objective data must include...

The crystalline silica material in question.

The source of the objective data.

The testing protocol and results of the testing.

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 is based.

The employer shall ensure that objective data are maintained and made available in accordance with 29 CFR 1910.1020 (i.e., MIOSHA Part 470).



Objective Data Example

- **Jobsite A**: Exposure monitoring reveals employee exposures = $20 \mu\text{g}/\text{m}^3$; use of portable handsaw to cut the concrete floor in a $40' \times 40' \times 10'$, vented room; wet methods and HEPA vacuums are used; the concrete is 15% crystalline quartz.
- **Jobsite B**: No exposure monitoring has been performed; the employer wishes to use data from Jobsite A. The work at this site involves use of a portable handsaw to cut the concrete floor in a $20' \times 20' \times 8'$, unvented room; wet methods and HEPA vacuums are used; the concrete is 25% crystalline quartz.
- Can the employer use the data obtained at Jobsite A to represent employee exposures at Jobsite B?

NO, due to the elevated silica content and decrease in room size.



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.

Errata: No similar definition should exist in MIOSHA Part 590.



Definition: Regulated Area

Errata: Should be listed as Part 590, Rule 59015 (8)

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.



Note the improper use of respiratory protection (i.e., the respirator should be the first PPE on and the last off; the straps should be under the hood).



Silica Exposure Limits

Part 590, 1910.1053 (c) or Part 690, 1926.1153 (d)(1)

DANGER

$> 50 \mu\text{g}/\text{m}^3$

CAUTION

$\geq 25 \mu\text{g}/\text{m}^3$

“PERMISSIBLE”

$< 25 \mu\text{g}/\text{m}^3$

- **PEL:** permissible exposure limit
 $50 \mu\text{g}/\text{m}^3$, 8-hr TWA
- **AL:** action limit
 $25 \mu\text{g}/\text{m}^3$, 8-hr TWA



Exposure Assessment and Control

Part 590, General Industry

- Permissible exposure limit (PEL)
- Exposure assessment
- Regulated areas
- Methods of control:
 - Engineering and work practice controls
 - Written exposure control program
 - Abrasive blasting

Part 690, Construction

- **29 CFR 1926.1153 (c):** Table 1
 - Table 1
 - Means of exhaust, wet methods, and enclosed cabs/booths
 - Multiple Table 1 tasks performed during a work shift

...OR...

- **29 CFR 1926.1153 (d):**
 - Permissible exposure limit (PEL)
 - Exposure assessment
 - Methods of compliance



Specified Exposure Control Methods

Part 690, 1926.1153 (c)

- *For each employee engaged in a task identified on Table 1, the employer shall fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, unless the employer assesses and limits the exposure of the employee to respirable crystalline silica in accordance with paragraph (d) of this section.*
- Employees are **“engaged in a task”** when:
 - Operating the listed equipment,
 - Assisting with the task, OR
 - Having some responsibility for the completion of the task.
- Employees are **not “engaged in a task”** if they are only in the vicinity of a task.



Specified Exposure Control Methods

Part 690, 1926.1153 (c)(1), Table 1 Equipment/Tasks

1. Stationary masonry saws
2. Handheld power saws
3. Handheld power saws for cutting fiber-cement board
4. Walk-behind saws
5. Drivable saws
6. Rig-mounted core saws or drills
7. Handheld and stand-mounted drills
8. Dowel drilling for concrete
9. Vehicle-mounted drilling rigs for rock and concrete
10. Jackhammers and handheld powered chipping tools
11. Handheld grinders for mortar removal (i.e., tuckpointing)
12. Handheld grinders for uses other than mortar removal
13. Walk-behind milling machines and floor grinders
14. Small drivable milling machines
15. Large drivable milling machines
16. Crushing machines
17. Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials
18. Heavy equipment and utility vehicles for tasks such as grading and excavating



Example of Part 690 Table 1 Task/Activity

Stationary Masonry Saw





Example of Part 690 Table 1 Task/Activity

Stationary Masonry Saw

Equipment or Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Stationary masonry saws	<p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p>	None	None



Example of Part 690 Table 1 Task/Activity

Handheld Power Saws (any blade diameter)





Example of Part 690 Table 1 Task/Activity

Handheld Power Saws (any blade diameter)

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



Example of Part 690 Table 1 Task/Activity

Vehicle Mounted Drilling Rigs for Rock and Concrete





Example of Part 690 Table 1 Task/Activity

Vehicle Mounted Drilling Rigs for Rock and Concrete

Equipment or Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Vehicle mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.	None	None
	OR Operate from within an enclosed cab and use water for dust suppression on drill bit.	None	None



Implementation of Table 1 Control Measures

Part 690, 1926.1153 (c)(2)

- Tasks performed indoors or in enclosed areas
- Tasks performed using wet methods
- Measures implemented that include an enclosed cab or booth



Tasks Performed Indoors or in Enclosed Areas

Part 690, 1926.1153 (c)(2)(i)

Provide a means of exhaust as needed to minimize the accumulation of visible airborne dust.





Tasks Performed Using Wet Methods

Part 690, 1926.1153 (c)(2)(ii)



Apply water at flow rates sufficient to minimize release of visible dust.



Measures Including an Enclosed Cab or Booth

Part 690, 1926.1153 (c)(2)(iii)



Ensure that the enclosed cab or booth:

- A. Is maintained as free as practicable from settled dust;
- B. Has door seals and closing mechanisms that work properly;
- C. Has gaskets and seals that are in good condition and working properly;
- D. Is under positive pressure maintained through continuous delivery of fresh air;
- E. Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 μm range (e.g., MERV-16 or better); and
- F. Has heating and cooling capabilities.



Performing > One Table 1 Task During a Shift

Part 690, 1926.1153 (c)(3)

- Where an employee **performs more than one task on Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours**, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift.
- If the **total duration of all tasks on Table 1 combined is less than four hours**, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.



Alternative Exposure Control Methods

Part 690, 1926.1153 (d)

- For tasks **not addressed by Table 1, OR**
- Where one **cannot fully and properly implement** the engineering controls, work practices, and respiratory protection specified by Table 1, **THEN comply with paragraph (d).**



Employee using demo saw without water control measures; exposure > 45× new OSHA PEL for respirable crystalline silica.



Exposure Assessment

Part 590, 1910.1053 (d) or Part 690, 1926.1153 (d)(2)

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)(ii) or the **scheduled monitoring option** in paragraph (d)(2)(iii) of this section.





Exposure Assessment

Part 590, 1910.1053 (d)(2) or Part 690, 1926.1153 (d)(2)(ii)

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.**

Air Sampling Worksheet

U. S. Department of Labor
Occupational Safety and Health Administration

1. Reporting ID: 444444 2. Inspection Number: 123456789 3. Sampling Number: 497330106 6. Shipping Date: 06-15-07
4. Establishment Name: J & N Casting 7. Person Performing Sampling (Signature): [Signature] 8. PPE Last Name: RIMA 14. Exposure Information: a. Number: 2 b. Duration: 3.5 hrs ea person
10. Employee Name, Address, Telephone Number: B.J. Albrecht, 860 Lezo Road, Pitar City, CA 99999 11. Job Title: Brass Squeeze Molder Machine Operator - 12 years 12. Occupation Code: 15. Frequency: 6 hr./day 16. Photo(s): Y
13. PPE (Type and effectiveness): Safety glasses and ear plugs, no respirator worn 17. Pump Checks and Adjustments: 7:30 - ok, 8:30 - ok, 9:30 - ok, 10:30 - ok, 11:30 - ok, 12:30 - ok, 1:30 - ok, 2:30 - ok

18. Job Description, Operation, Work Location(s), Ventilation, and Controls
Operates brass squeeze molding machine. Fills and compacts sand into mold. Finished mold: placed on pouring line. There are fans but no exhaust ventilation.

19. Pump Number: 10337	Sampling Data		19. Total Time (in minutes)	20. Lab Sample Number
21. Sample Submission Number: ER300	6:30am	1:00pm	360	21. Sample Submission Number: ER300
22. Sample Type: P	12:30pm	2:45pm	2.13	22. Sample Type: P
23. Sample Media: MCEF			2.13	23. Sample Media: MCEF
24. Filter Tube Number: 6:30am			766.8	24. Filter Tube Number: ER300
25. Time On/Off: 12:30pm			230	25. Time On/Off: 6:30am - 1:00pm, 12:30pm - 2:45pm
26. Total Time (in minutes): 360			996.8 Total volume	26. Total Time (in minutes): 360
27. Flow Rate: <input checked="" type="checkbox"/> l/min <input type="checkbox"/> cc/min: 2.13				27. Flow Rate: <input checked="" type="checkbox"/> l/min <input type="checkbox"/> cc/min: 2.13
28. Volume (in liters): 766.8				28. Volume (in liters): 766.8
29. Net Sample Weight (in mg):				29. Net Sample Weight (in mg):
30. Analyze Samples for:				30. Analyze Samples for:
31. Indicate Which Samples to Include In TWA, Ceiling, etc. Calculations: T				31. Indicate Which Samples to Include In TWA, Ceiling, etc. Calculations: T
32. Interferences and IH Comments to Lab:				32. Interferences and IH Comments to Lab:
33. Supporting Samples: a. Blank: ER302				33. Supporting Samples: a. Blank: ER302
34. Chain of Custody: a. Seals Intact? Y				34. Chain of Custody: a. Seals Intact? Y
b. Packed in Lab				b. Packed in Lab
c. Rec'd by Anal.				c. Rec'd by Anal.
d. Anal. Completed				d. Anal. Completed
e. Calc. Checked				e. Calc. Checked
f. Sign. OK'd				f. Sign. OK'd

Case File Page of OSHA-91A (Rev. 1/84)



Scheduled Monitoring Option

Part 590, 1910.1053 (d)(3) or Part 690, 1926.1153 (d)(2)(iii)

- 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.**
- Where several employees perform the same tasks on the same shift and in the same work area, the **employer may sample a representative fraction** of these employees in order to meet this requirement.
- In representative sampling, the employer shall sample the employee(s) who are **expected to have the highest exposure** to respirable crystalline silica.

Frequency of Monitoring

- Initial results $<$ AL: No additional monitoring
- Most recent result \geq AL Repeat again within 6 months
- Most recent result $>$ PEL Repeat again within 3 months
- When two consecutive non-initial results, taken 7 or more days apart, but less than 6 months, are $<$ AL Can discontinue monitoring

If/when conditions change...

REASSESS!



Reassessment of Exposures

Part 590, 1910.1053 (d)(4) or Part 690, 1926.1153 (d)(2)(iv)

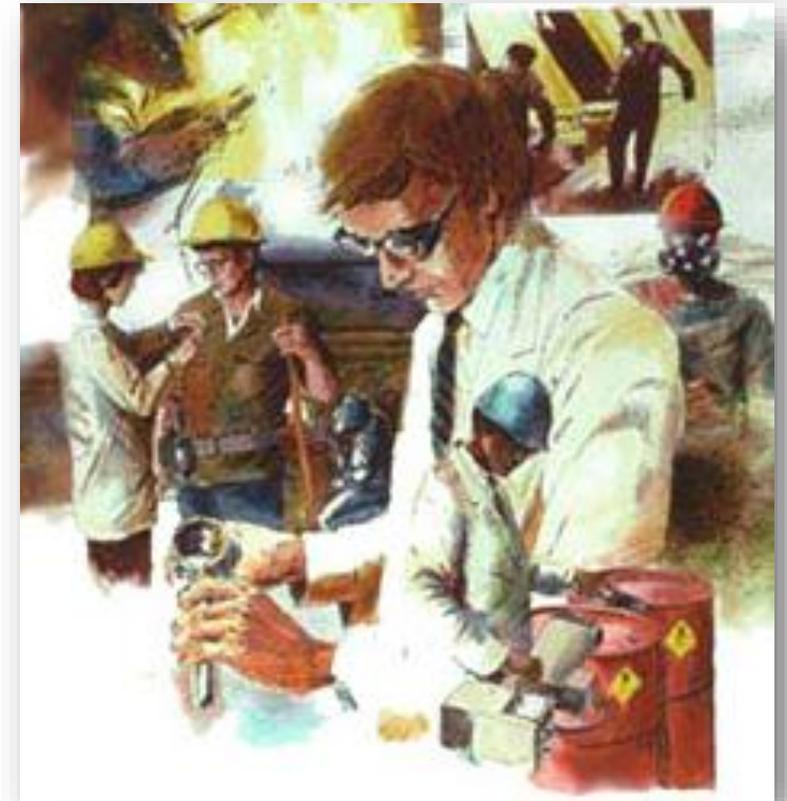
- Reassess exposures **whenever a change in the production, process, control equipment, personnel, or work practices** may reasonably be expected to result in new or additional exposures at or above the action level, **OR**
- When the employer has any reason to believe that **new or additional exposures** at or above the action level have occurred.



Methods of Sample Analysis

Part 590, 1910.1053 (d)(5) or Part 690, 1926.1153 (d)(2)(v)

- Employers must ensure that samples are analyzed by a laboratory that follows the procedures in **Appendix A**.
- **Appendix A** specifies methods of sample analysis:
 - Allows for use of OSHA, NIOSH, or MSHA methods (six methods specified).
 - Analysis must be conducted by accredited laboratories that follow specified quality control procedures.





Employee Notification

Part 590, 1910.1053 (d)(6) or Part 690, 1926.1153 (d)(2)(vi)

- **Individually notify in writing each affected employee within 5 days of the exposure assessment of the results of that assessment or post the results in an appropriate location accessible to all affected employees.**
- Whenever an exposure assessment indicates that **employee exposure is above the PEL**, the employer shall **describe in the written notification the corrective action being taken** to reduce employee exposure to or below the PEL.



Observation of Monitoring

Part 590, 1910.1053 (d)(7) or Part 690, 1926.1153 (d)(2)(vii)

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



Regulated Area

Only in **Part 590, 1910.1053 (e)**

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.**



Note the improper use of respiratory protection (i.e., the respirator should be the first PPE on and the last off; the straps should be under the hood).



Methods of Compliance

Part 590, 1910.1053 (f) or Part 690, 1926.1153 (d)(3)

- **General industry:**
 - Engineering and work practice controls, 1910.1053 (f)(1)
 - Written exposure control program, 1910.1053 (f)(2)
 - Abrasive blasting 1910.1053 (f)(3)
- **Construction:**
 - Engineering and work practice controls, 1926.1153 (d)(3)(i)
 - Abrasive blasting, 1926.1153 (d)(3)(ii)



Engineering and Work Practice Controls

Part 590, 1910.1053 (f)(1) or Part 690, 1926.1153 (d)(3)(i)

- Employers shall **use engineering and work practice controls** to limit exposures to or below the PEL unless they are demonstrated to be not feasible.
- Use such controls even if they do not reduce exposures to or below the PEL; **use to achieve lowest feasible level.**
- **Respirators permitted where PEL cannot be achieved** with engineering and work practice controls



Wet methods



HEPA vacuum



HEPA-filtered respiratory protection



Construction Engineering Control Example 1

Grinding/Polishing Stone



Grinding stone
without engineering controls



Polishing stone using water to
control the dust



Construction Engineering Control Example 2

Grinding



Grinding without engineering controls



Grinding using a vacuum dust collector



Construction Engineering Control Example 3

Jackhammer



Jackhammer use without engineering controls



Jackhammer use with water spray to control dust



Written Exposure Control Plan

Part 590, 1910.1053 (f)(2) or Part 690, 1926.1153 (g)

Silica Exposure Control Plan

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Responsibilities.....	4
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Medical Surveillance	19
Employee Training 29 CFR 1926.1153 (i) (2) (i).....	21
Recordkeeping (29 CFR 1926.1153 (j)).....	22

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).



Written Exposure Control Plan – continued

Part 590, 1910.1053 (f)(2) or Part 690, 1926.1153 (g)

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- **Review** the plan **annually**; update as necessary.
- **Make** the plan **readily available**.



Competent Person

Part 690, 1926.1153 (g)(4)



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.**



Abrasive Blasting

Part 590, 1910.1053 (f)(3) or Part 690, 1926.1153 (d)(3)(ii)



The employer shall **comply with other OSHA standards**, when applicable, such as (MIOSHA Part 620), where abrasive blasting is conducted using crystalline silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.



Respiratory Protection

Part 590, 1910.1053 (g) or Part 690, 1926.1153 (e)



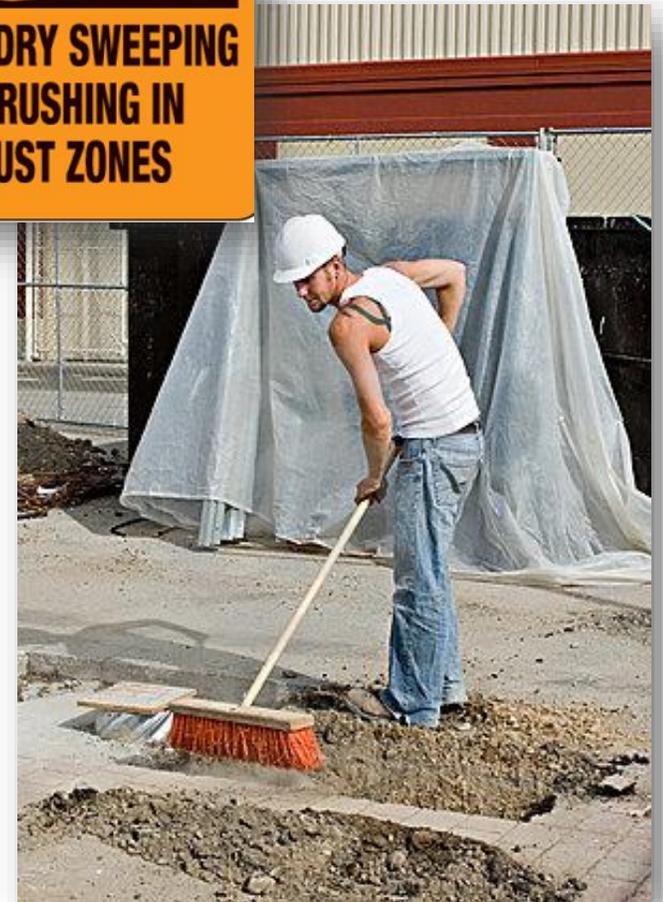
- **Must comply with MIOSHA Part 451.**
- If exposures exceed the PEL, respirators are required:
 - For tasks where controls and/or work practices are not feasible.
 - While installing or implementing feasible controls and/or work practices.
 - When implemented feasible controls measures and/or work practices do not reduce exposures below the PEL.
 - As required by Table 1 for construction employers.
 - While employees are in a regulated area for GI employers.



Housekeeping – Dry Sweeping/Brushing

Part 590, 1910.1053 (h)(1) or 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.*





Housekeeping – Compressed Air

Part 590, 1910.1053 (h)(2) or Part 690, 1926.1153 (f)(2)

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.





Medical Surveillance

Part 590, 1910.1053 (i) or Part 690, 1926.1153 (h)

PROVISION (within 30 days after initial assignment):

- **General Industry:** Employers must make available medical examinations to **workers exposed above the action level (AL)** under Part 590 for 30 or more days a year.
- **Construction:** Employers must make available medical examinations to **workers required to wear a respirator** under Part 690 for 30 or more days a year.





Medical Surveillance

Part 590, 1910.1053 (i) or 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 590, 1910.1053 (i) or Part 690, 1926.1153 (h)

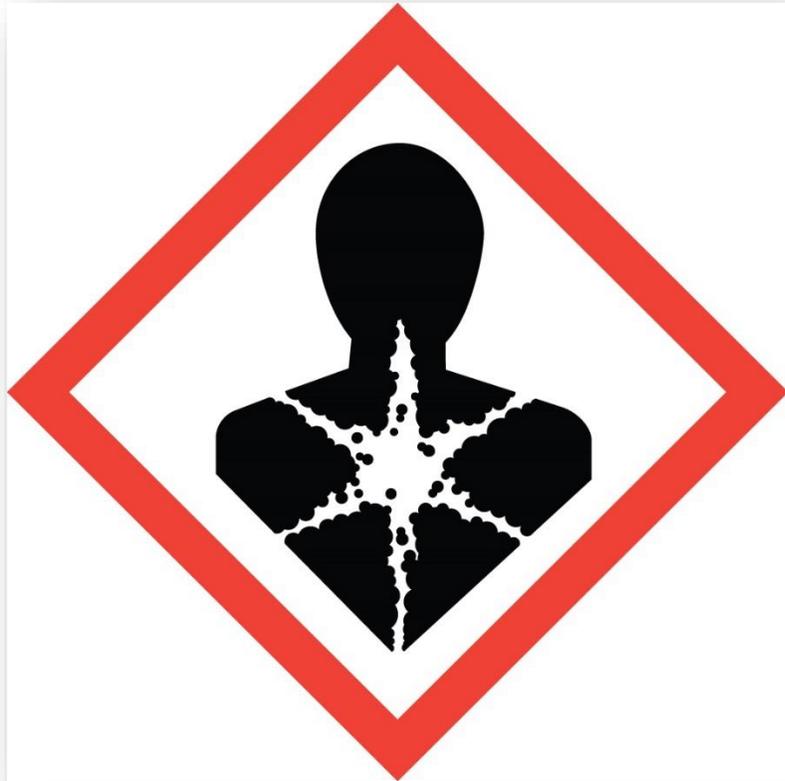
- **Worker receives report** with detailed medical findings.
- **Employer receives an opinion** that only describes limitations on respirator use, and if the worker gives written consent, recommendations on:
 - Limitations on exposure to respirable crystalline silica, and/or
 - Examination by a specialist.





Communication of Silica Hazards – HAZCOM

Part 590, 1910.1053 (j) or Part 690, 1926.1153 (i)



HAZARD COMMUNICATION

- *Include respirable crystalline silica in the program established to comply with the hazard communication standard (HCS) (29 CFR 1910.1200).*
- *Ensure that each employee has **access to labels on containers of crystalline silica and safety data sheets**, and is trained in accordance with the provisions of HCS and Part 590 or 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 590, 1910.1053 (j) or 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 590 or Part 690**, as appropriate;
- **Identity of the competent person** designated by the employer (**Part 690 only**); **AND**
- **Purpose and a description of the medical surveillance program.**



Communication of Silica Hazards – Signage

Part 590, 1910.1053 (j)



SIGNAGE

Post signs at all entrances to regulated areas that contain the information identified on this slide.

NOTE: This sign is only required by Part 590; it is not required by Part 690.



Recordkeeping

Part 590, 1910.1053 (k) or 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.





Dates: General Industry Standard

Part 590, Rule 59005

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
JUNE 2018						
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

Employers must comply with all requirements by **June 23, 2018** except:

- **Hydraulic fracturing operations in the oil and gas industry:**

- Medical surveillance: **see below.**
- Engineering controls: **June 23, 2021.**
- All other provisions: **June 23, 2018.**

- **Medical surveillance obligations in paragraph (i)(1)(i):**

- Employees exposed \geq 30 days or more per year at or above the PEL: **June 23, 2018.**
- Employees exposed \geq 30 days or more per year at or above the AL: **June 23, 2020.**



Dates: Construction Standard

Part 690, Rule 69005

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
JUNE 2017						
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

Employers must comply with all requirements, except methods of sample analysis, paragraph (d)(2)(v), by **June 23, 2017**.



Dates: Construction Standard – continued

Part 690, Rule 69005

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
JUNE 2018						
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

- Compliance with **methods of sample analysis** required by **June 23, 2018**.
- Methods of sample analysis, section (d)(2)(v):

The employer shall ensure that all samples taken to satisfy the monitoring requirements of paragraph (d)(2) of this section are evaluated by a laboratory that analyzes air samples for respirable crystalline silica in accordance with the procedures in Appendix A to this section.



Appendix A: Methods of Sample Analysis

Part 590 and Part 690

- Specifies procedures for analyzing air samples for respirable crystalline silica and quality control procedures employers must ensure laboratories use when performing an analysis.
- The employer must ensure the laboratory:
 - Evaluates all samples using one of six analytical methods;
 - Is accredited with respect to crystalline silica analyses;
 - Uses the most current traceable standards for instrument calibration or instrument calibration verification;
 - Implements an internal quality control (QC) program;
 - Characterizes the sample material; **AND**
 - Analyzes quantitatively for crystalline silica and performs specified instrument calibration checks.





Appendix B: Medical Surveillance Guidelines

Part 590 and Part 690

Appendix is divided into seven sections:

- Section 1: Recognition of silica-related diseases.
- Section 2: Medical surveillance.
- Section 3: Roles and responsibilities.
- Section 4: Confidentiality and other considerations.
- Section 5: Resources.
- Section 6: References.
- Section 7: Sample forms.



Resources

- Silica Small Entity Compliance Guide for Construction
www.osha.gov/Publications/OSHA3902.pdf
- OSHA Crystalline Silica Fact Sheet
osha.gov/OshDoc/data_General_Facts/crystalline-factsheet.pdf
- NIOSH Silica Information Webpage
www.cdc.gov/niosh/topics/silica



Resources (continued)

- Center for Protection of Worker Rights
- Center for Construction Research and Training
www.silica-safe.org

- Video clips – What’s Working
<http://www.silica-safe.org/whats-working/controlling-silica-dust-learning-from-each-other>

- Federal Register – Silica Standard
<https://www.federalregister.gov/documents/2016/03/25/2016-04800/occupational-exposure-to-respirable-crystalline-silica>

- Hollow drill bits for rotary hammers with local exhaust ventilation
<https://www.youtube.com/watch?v=iC-Ze4jTs0M>

Work Safely with Silica
A ONE-STOP SOURCE OF INFORMATION ON HOW TO PREVENT A SILICA HAZARD AND PROTECT WORKERS

About • Know the Hazard • Regulations & Requirements • What's New • Create-A-Plan

Know the Hazard ⚠️
Workers may be exposed to dangerous levels of silica dust when cutting, drilling, grinding, or otherwise disturbing materials that contain silica. These materials and tasks are common on construction jobs. Breathing that dust can lead to serious, often fatal illnesses. This section contains information that workers – and contractors – need to know to recognize the hazard, understand the risk factors, and work safely with silica.

Control the Dust 📋
There are ways **contractors** can reduce the dust and reduce the hazard. This easy to use planning tool takes you step-by-step through conducting a **job hazard analysis for silica**, selecting appropriate controls, and creating a job-specific plan to eliminate or reduce silica hazards. You can save as a pdf, print and/or email your plan.

CREATE-A-PLAN



Keep your head out of the clouds...but don't bury it in the pile either!

Begin to determine how the appropriate silica standard may be complied with in your workplace today!





Summary

Provided an overview of the content of MIOSHA Part 590, Silica in General Industry, and Part 690, Silica in Construction.

