MIOSHA Training Institute

MIOSHA Michigan Occupational Safety and Health Administration

Macomb Community College

Silica Awareness

Student Materials
MTI Elective Compliance Course
Consultation Education and Training Division
Michigan Occupational Safety and Health Administration
Michigan Department of Labor and Economic Opportunity
www.michigan.gov/miosha
517-284-7720

MICHIGAN DEPARTMENT OF LABOR & ECONOMIC OPPORTUNITY

(Revised 02/24)

MIOSHA Michigan Occupational Safety and Health Administration

Silica Awareness

MIOSHA Training Institute (MTI) Elective Course

Presented By:

Consultation Education and Training Division

Michigan Occupational Safety and Health Administration

Michigan Department of Labor and Economic Opportunity

MIOSHA
Michigan Occupational Safety and Health Administration

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COURSE OBJECTIVES

- **Module 1: Silica Health Overview**
  - Explain the hazards associated to respirable crystalline silica
  - Describe the health effects associated to respirable crystalline silica exposure
- **Module 2: Silica Regulations**
  - Understand MIOSHA silica standards in general industry & construction operations
- **Module 3: Exposure Characterization & Control Methods**
  - Describe how to control exposures to respirable crystalline silica through work practices, engineering controls & respiratory protection
  - Utilize State & Federal resources to implement work practices to minimize employee exposure to respirable crystalline silica

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MODULE ONE

Silica Health Overview

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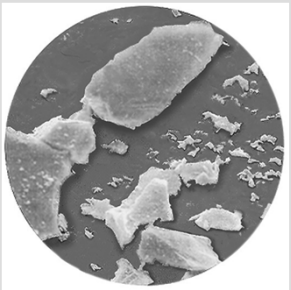

TYPES OF SILICA

Silica – Silicon Dioxide (SiO_2)

- Crystalline Mineral Polymorphs: Quartz, Cristobalite, & Tridymite
- Amorphous (non-crystalline) are not regulated

Quartz Content

- Sandstone (70-90%)
- Granite (30%)
- Brick (30%)
- Concrete/Mortar (25-70%)
- Limestone/Marble (2%)

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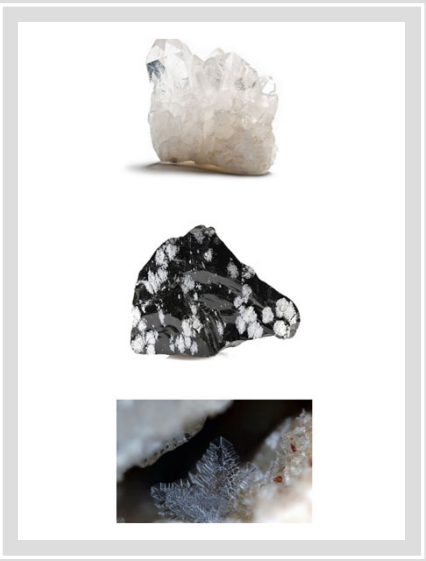
TYPES OF CRYSTALLINE SILICA

Quartz: Most common form of crystalline silica & the second most common mineral on the earth's surface.

Cristobalite: Scare in nature. Some volcanic rocks & meteorites may contain small amounts. Forms when quartz is heated at high temperatures (>450°C).

Tridymite: Scare in nature. Some volcanic rocks & meteorites may contain small amounts. Tridymite is not a stable form created from quartz.



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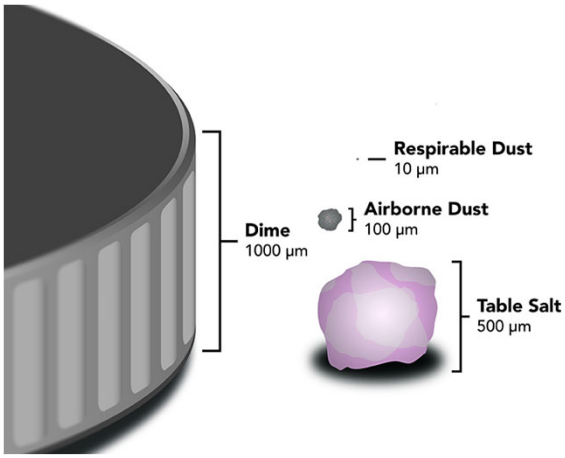
RESPIRABLE CRYSTALLINE SILICA

Respirable Crystalline Silica (RCS)

- 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**.



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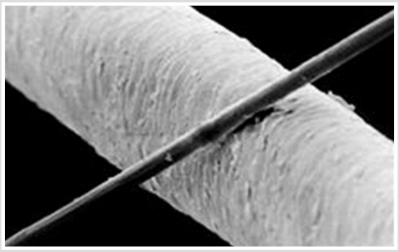

HEALTH HAZARDS – CONTRIBUTING FACTORS

- Particle Size
- Percentage of Silica in Dust
- Length of Exposure
- Dose-Response Relationship
- Individual Susceptibility
- Cigarette Smoking

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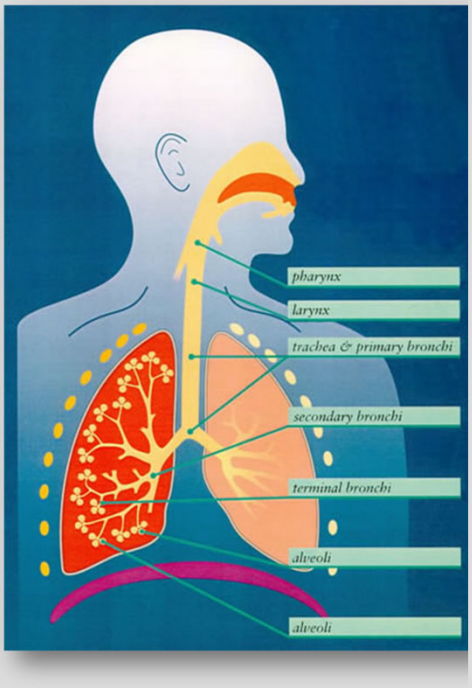

HEALTH HAZARDS

- Respirable Fraction – 10 microns or less
- Damage to Alveolar Tissue
- Permanent & Irreversible
- Symptoms
  - Shortness of Breath
  - Severe Cough
  - Chest Pains
  - General Weakness
- Few to no symptoms in early stages of diseases

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SILICA RELATED DISEASES

- Silicosis
- Lung Cancer
- Chronic Obstructive Pulmonary Disease (COPD)
- Non-Malignant Respiratory Diseases (e.g. bronchitis)
- Kidney Diseases
- Autoimmune & Cardiovascular Diseases

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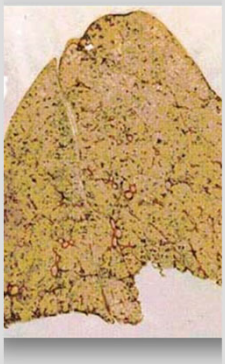
HEALTH EFFECTS - SILICOSIS

- **Chronic:** 10 or more years after repeated exposure
- **Accelerated:** 5 to 10 years of elevated exposure
- **Acute:** a few months to 2 years of extremely high exposure



Healthy Lung

Silicotic Lung

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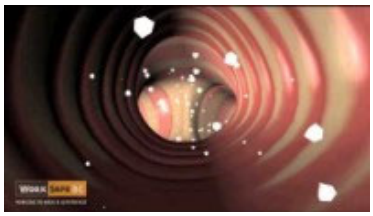

DANGER OF SILICA DUST

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SILICA IN THE WORKPLACE – EXPOSURE SOURCE MATERIALS

- Concrete
- Masonry
- Sandstone
- Rock
- Paint
- Abrasives
- Mortar
- Plaster
- Ceramics
- Shingles
- Soil
- Composites

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SILICA HAZARD RECOGNITION QUESTIONS TO ASK

- What are the raw materials?
- Are SDS's available? Have they been reviewed?
- What is the operation
- Are there any intermediate products and by-products formed?
- What is the end product?
- Are there any periodic cleaning or maintenance procedures?
- Are exposures impacting employees?

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SILICA RECOGNITION – BUILDING MATERIALS

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SILICA RECOGNITION – COATING & ABRASIVES

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SILICA RECOGNITION – NON-ROUTINE TASKS

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WARNING

Silicosis IS NOT CURABLE, but IT IS PREVENTABLE

Don't be ***THAT GUY***

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MODULE TWO

Silica Regulations

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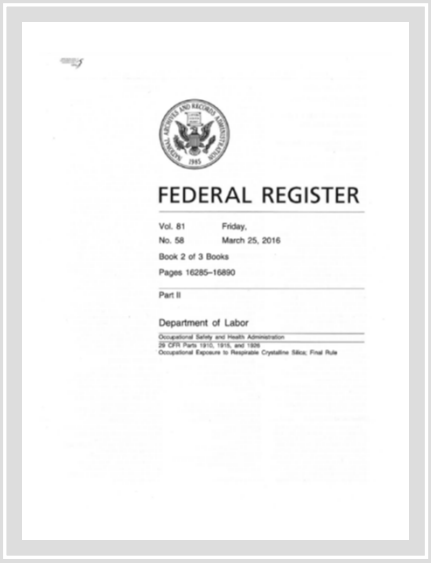
FEDERAL REGISTER

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Book 2 of 3 Books
Pages 16285–16890

Part II

Department of Labor

Occupational Safety and Health Administration

29 CFR Parts 1910, 1915, and 1926

Occupational Exposure to Respirable Crystalline Silica; Final Rule

MIOSHA SILICA REGULATIONS

- MIOSHA adopted federal OSHA standards published in 2016
- MIOSHA Part 590 – Silica in General Industry (OSHA 29 CFR 1910.1053)
- MIOSHA Part 690 – Silica in Construction (OSHA 29 CFR 1026.1153)

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REASONS FOR THE UPDATED STANDARDS

- Previous permissible exposure limits (PELs) did not adequately protect employees
- Epidemiological evidence indicated lung cancer & silicosis occurring at lower exposure levels (<100 µg/m^3)
- OSHA estimates more than **840,000** employees in construction & more than **100,000** employees in general industry are exposed to silica levels that exceed the updated permissible exposure limit

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SILICA – STATE EMPHASIS PROGRAM (SEP)

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REGULATIONS – GENERAL INDUSTRY

Part 590 – Silica in General Industry

- **Applies:** *to all occupational exposure to respirable crystalline silica except: construction work, agricultural operations, & exposures that result from working with sorptive clays*
- **Does not apply**:
  - *Where employee exposures will remain below 25 µg/m3 as an 8-hr TWA under any foreseeable conditions (objective data)*

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REGULATIONS – CONSTRUCTION

Part 690 – Silica in Construction

Applies: *to all occupational exposure to respirable crystalline silica in construction*

Does not apply:

Where employee exposures will remain below 25 µg/m3 as an 8-hr TWA under any foreseeable conditions (objective data)

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DEFINITIONS GENERAL INDUSTRY VS. CONSTRUCTION

Part 590 General Industry	Part 690 Construction
1. Action Level	1. Action Level
2. Assistant Secretary	2. Assistant Secretary
3. Director	**3. Competent Person (not defined in GI)**
4. Employee Exposure	4. Director
5. High Efficiency Particulate (HEPA) Filter	5. Employee Exposure
6. Objective Data	6. High Efficiency Particulate Air (HEPA) Filter
7. Physician or Other Licensed Health Care Professional (PLCHP)	7. Objective Data
8. Regulated Area (not defined in const)	8. Physician or Other Licensed Health Care Professional (PLCHP)
9. Respirable Crystalline Silica	9. Respirable Crystalline Silica
10. Specialist	10. Specialist
11. This Section	11. This Section

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DEFINITIONS

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 RCS associated with a particular product/material or a specific process/task/activity
- The data **must** reflect workplace conditions close resembling (or with a higher exposure potential than the processes), type of material, control methods, work practices, & environmental conditions in the employer's current operations

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DEFINITIONS

Competent Person (Construction):

- An individual who is capable of identifying existing & foreseeable RCS hazards int eh workplace & who has the authorization to take prompt corrective measures to eliminate or minimize them. The competent person must have knowledge & ability necessary to fulfill the responsibilities set forth in paragraph (g) of this section
  - By way of training and/or experience, a competent person is **knowledgeable** of applicable standards, is **capable** of identifying workplace hazards relating to the specific operation and has the **authority** to correct them.
  - There are no specific standards regarding competent person requirements

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DEFINITIONS

Regulated Area (General Industry):

- **Establishment** – The employer *shall* establish a regulated area wherever an employee's exposure to airborne concentrations of RCS 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 minimized 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 & required by work duties to be present,
  - Designated representatives exercising the right to observe, and
  - Any person authorized by the Occupational, Safety, & Health Act

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DEFINITIONS

Employee Exposure:

- Exposure to airborne RCS that would occur if the employee were not using a respirator
  - Permissible Exposure Limit (PEL): 50 $\mu g/m^3$
  - Action Level (AL): 25 $\mu g/m^3$

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PERMISSIBLE EXPOSURE LIMIT PERSPECTIVE

~1,000 µg of silica

1,000 µg of silica in this room = 50 µg/m^3

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COMMUNICATION OF RESPIRABLE SILICA HAZARDS

The employer ***shall*** include respirable crystalline silica in their Hazard Communication Program

- Employees will have access to labels on containers of crystalline silica
- Employees will have access to safety data sheets
- Employees will be provided training in accordance with Hazard Communication regarding silica hazards
- The following silica hazards must be addressed:
  - Cancer
  - Lung effects
  - Immune system effects
  - Kidney effects

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EMPLOYEE INFORMATION & TRAINING

The employer ***shall*** ensure that each employee covered under the silica standard can demonstrate knowledge & 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 Controls**
  - **Work Practices**
  - **Respiratory Protection**
- The contents of this section of the silica standard
- The **purpose** & description **of the medical surveillance program** required
- The employer shall make a copy of the section readily available without cost to each employee covered

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MEDICAL SURVEILLANCE

- The employer *shall* make medical surveillance available for each employee exposed to silica <u>at or above the AL for 30 days or more per year</u>
  - Must be performed by a PLCHP
  - 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 & work history (past, present, anticipated silica exposures, other respiratory agents, respiratory dysfunction, TB & smoking history)
  - Physical exam – special emphasis on respiratory system
  - Chest x-rays – specific requirements see standard
  - Pulmonary Function Test
  - Testing for latent TB infection
  - Any other tests deemed appropriate by the PLCHP
- The employer shall make & maintain accurate records

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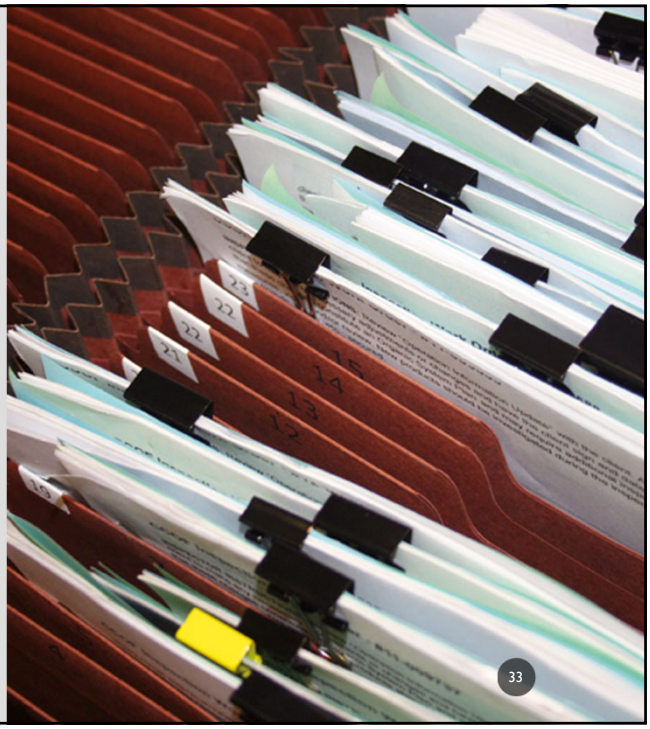
RECORDKEEPING

Make & maintain accurate records:

- Air monitoring data,
- Objective data, *and*
- Medical Records

Content of records are specified within the standard



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METHODS OF COMPLIANCE

Engineering & Work Practice Controls

- The employer ***shall*** use engineering & work practice controls to reduce & maintain employee exposure to or below the PEL (unless determined to not be feasible)
- Employer ***must*** use engineering controls – even if it doesn't reduce exposure below the PEL
- Employer will supplement engineering controls with respiratory protection

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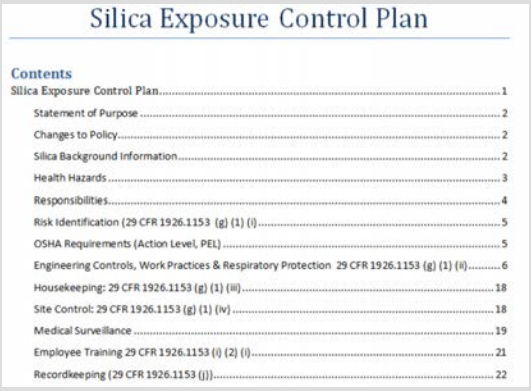
Silica Exposure Control Plan

Contents

METHODS OF COMPLIANCE

Written Exposure Control Plan

- ❑The employer ***shall*** establish & implement a written exposure control plan that contains at least the following:
  - A description of the tasks in the workplace that involve exposure to RCS
  - A description of engineering controls, work practices, & respiratory protection used to limit silica exposures
  - A description of housekeeping measures to limit silica exposures
- ❑The written exposure control plan ***shall*** be reviewed & evaluated annually
- ❑The written exposure control plan ***shall*** be readily available for review & copy

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MIOSHA SAMPLE EXPOSURE CONTROL PLAN

Silica Exposure Control Plan Template


Michigan Department of Labor and Economic Opportunity
Michigan Occupational Safety and Health Administration
Consultation Education and Training Division

"Sample"

[Company Name]

Silica Exposure Control Plan

[Date]

Note: This document is intended as a compliance guide for MIOSHA Occupational Health Part 590 Silica In General Industry and Part 690 Silica In Construction. This guide does not substitute for a full reading of the standard. This document is provided as an informational service under the authority of Public Act 154 of 1974. Its purpose is to aid in the development of written programs related to silica exposure. This program is designed to be adapted to each individual employer's need; items should be shortened, expanded, or duplicated as needed.

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MODULE THREE

Exposure Characterization & Control Measures

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EXPOSURE CONTROLS METHODS

Three Options for Exposure Control

Performance/Scheduled Air Monitoring	Objective Data	OSHA Table I

So Review Your Particular Situation..

Resource Availability ⊕	⊕ Exposure Frequency
Hazard/Risk ⊕	⊕ Severity
Workforce ⊕	⊕ Cost
Administration ⊕	⊕ Difficulty

..to Determine the Best Alternative

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EXPOSURE CONTROL METHODS

Option 1: Performance/Scheduled Air Monitoring

Performance/Scheduled Air Monitoring	Objective Data	OSHA Table 1

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EXPOSURE CONTROLS METHODS

<u>Exposure Assessment</u>

The employer ***shall*** assess the exposure of each employee who is or may reasonably be expected to be exposed to RCS at or above the AL in accordance with either the **performance option** or the **scheduled monitoring option**

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EXPOSURE CONTROL METHODS

Performance Option:

The employer ***shall*** assess the 8-hr TWA exposure for each employee on the basis of ***any combination of air monitoring data or objective data*** sufficient to accurately characterize employee exposure to RCS

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EXPOSURE CONTROL METHODS

Scheduled Monitoring Option:

- The employer ***shall*** perform initial monitoring to assess the 8-hr 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 & 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 RCS

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EXPOSURE CONTROL METHODS – AIR MONITORING FREQUENCY

Initial Results < AL	No additional monitoring
Most recent result ≥ AL	Repeat within 6 months
Most recent result > PEL	Repeat 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

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EXPOSURE ASSESSMENT – EMPLOYEE NOTIFICATION

Within **15 working days** after complete 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

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EXPOSURE CONTROL METHODS

Option 2: Objective Data

Performance/Scheduled Air Monitoring	Objective Data	OSHA Table 1

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EXPOSURE CONTROL METHODS OBJECTIVE DATA

OBJECTIVE DATA

- Information… demonstrating employee exposure to RCS associated with a particular:
  - Product or material
  - A specific process, task, or activity
- Examples
  - Air monitoring data from industry-wide surveys
  - Calculations based on the composition of a substance
  - Area sampling results & exposure mapping profile approaches
  - Historical air monitoring data collected by the employer

The data must reflect workplace conditions closely resembling the employer's current operations

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OBJECTIVE DATA – EXAMPLE

Jobsite A	Jobsite B
• Exposure monitoring reveals employee exposure of 20 mg/m3 • Use portable handsaw to cut concrete floor in 40'x40'x10' vented room • Use wet methods & HEPA vacuums • Concrete is 15% crystalline quartz	• No exposure monitoring • Use portable handsaw to cut concrete floor in 20'x20'x10' unvented room • Use wet methods & HEPA vacuums • Concrete is 25% crystalline quartz

Can the employer use the data obtained at Jobsite A to represent employee exposure at Jobsite B?

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EXPOSURE CONTROL METHODS

Option 3: OSHA Table 1

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EXPOSURE CONTROL METHODS

OSHA TABLE 1 TASKS

Table 1 Tasks with Specified Control Methods

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 & stand-counted drills
8. Dowel drilling for concrete
9. Vehicle-mounted drilling rigs for rock & concrete
10. Jackhammers & handheld powered chipping tools
11. Handheld grinders for mortar removal (i.e., tucking pointing)
12. Handheld grinders for uses other than mortar removal
13. Walk-behind milling machines & floor grinders
14. Small drivable milling machines
15. Large drivable milling machines
16. Crushing machines
17. Heavy equipment & utility vehicles used to abrade or fracture silica-containing materials
18. Heavy equipment & utility vehicles for tasks such as grinding & excavating

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EXPOSURE CONTROL METHODS – OSHA TABLE 1 TASKS

For each employee engaged in a task identified in Table 1

- The employer ***shall*** **fully & properly** implement the engineering controls, work practices & respiratory protection **specified for the task in Table 1**
- Except when the employer assesses & limits the employee's exposure to RCS in accordance with paragraph (d) of the standard – Using alternate exposure control methods)

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Table 1 Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica			
Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤4 hours/shift	>4 hours/shift
		Half Mask Air Purifying Respirator APF=10 	

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS

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ACTIVITY 1

For this activity refer to Table 1 of Part 690

- Identify the task & equipment that is being used.
- What type of Engineering Controls & Work Practices are required?
- What type of Respiratory Protection is required (or optional)?

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EXAMPLE 1: STATIONARY MASONRY SAW

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EXAMPLE 1: STATIONARY MASONRY SAW

Table 1
Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤4 hours/shift	>4 hours/shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None

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EXAMPLE 2: WALK-BEHIND SAW

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EXAMPLE 2: WALK-BEHIND SAW

Table 1
Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤4 hours/shift	>4 hours/shift
(iv) Walk-behind 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: —When used outdoors	None	None
	—When used indoors or in an enclosed area	APF 10	APF 10

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EXAMPLE 3: HANDHELD GRINDERS FOR MORTAR REMOVAL (I.E. TUCK-POINTING)

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EXAMPLE 3: HANDHELD GRINDERS FOR MORTAR REMOVAL (TUCK-POINTING)

Table 1
Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤4 hours/shift	>4 hours/shift
(xi) Handheld grinders for mortar removal (i.e., tuck-pointing)	Use grinder equipped with commercially available shroud and dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions 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 pre-separator or filter-cleaning mechanism	APF 10 	APF 25 

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EXAMPLE VIDEO – TABLE 1 TASK

Federal OSHA Video on Controlling Silica Dust in Construction for Table 1 Tasks

- Handheld Grinders for Mortar Removal (Tuck-pointing)

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ALTERNATIVE EXPOSURE CONTROL METHODS

- For tasks not address by Table 1

OR

- Where one cannot fully & properly implement the engineering controls, work practices, & respiratory protection specified by Table 1,

THEN

- Comply with paragraph (d)

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ALTERNATIVE EXPOSURE CONTROL METHODS

Required Respiratory Protection

- For tasks not listed in Table 1

OR

- When employer does not fully & properly implement controls described in table 1, where exposures exceed the PEL

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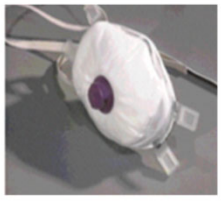
RESPIRATORY PROTECTION

- Use of respiratory protection must comply with MIOSHA Part 451 Respiratory Protection Standard
- Respiratory Protection is required:
  - Where exposures exceed the PEL during periods necessary to install or implement feasible engineering & work practice controls.
  - Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering & work practice controls are not feasible.
  - During tasks for which an employer has implemented all feasible engineering & work practice controls & such controls are not sufficient to reduce exposures to or below the PEL.
  - During periods when the employee is in a regulated area.
  - Or as specified by Table 1.



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RESPIRABLE CRYSTALLINE SILICA EXPOSURE SOURCES – OPERATIONS

- Abrasive Blasting/Sandblasting
- Bricklaying
- Stonemasons
- Concrete
- Cutting/Drilling Stone
- Crushing/Grinding Operators
- Demolition
- Foundries
- Furnace Workers
- Glass Manufacturers
- Kiln Operators
- Steelworkers
- Welders

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PART 451 RESPIRATORY PROTECTION

- Key Program Components
  - Selection procedure
  - Medical evaluations
  - Fit testing procedures
  - Procedures for proper use & maintenance
  - Procedures for cleaning, disinfecting, & storage
  - Procedures to ensure adequate air quality, quantity, & flow
  - Employee training
  - Program Evaluation
- Designate Program Administrator
- Provide respirators, training & medical surveillance at no cost to employees

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RESPIRATORY PROTECTION

- Must have a written respiratory protection program when respiratory use is required
  - MIOSHA Sample written respiratory protection program



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ACTIVITY 2

For this activity refer to Table 1 of Part 690

- Identify the task & equipment that is being used.
- What type of Engineering Controls & Work Practices are required?
- What type of Respiratory Protection is required (or optional)?

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EXAMPLE 1: HEAVY EQUIPMENT & UTILITY VEHICLE FOR TASKS SUCH AS GRADING & EXCAVATING, BUT NOT INCLUDING: DEMOLITION, ABRADING, OR FRACTURING

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EXAMPLE 1: HEAVY EQUIPMENT & UTILITY VEHICLE FOR TASKS SUCH AS GRADING & EXCAVATING, BUT NOT INCLUDING: DEMOLITION, ABRADING, OR FRACTURING

Table 1
Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤4 hours/shift	>4 hours/shift
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions OR When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab	None None	None None

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EXAMPLE 2: JACKHAMMERS & HANDHELD POWERED CHIPPING TOOLS

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EXAMPLE 2: JACKHAMMERS & HANDHELD POWERED CHIPPING TOOLS

Table 1
Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤4 hours/shift	>4 hours/shift
(x) Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact:		
	—When used outdoors	None	APF 10
	—When used indoors or in an enclosed area	APF 10	APF 10
	OR		
	Use tool equipped with commercially available shroud and dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions		
	Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism:		
	—When used outdoors	None	APF 10
	—When used indoors or in an enclosed area	APF 10	APF 10

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ENGINEERING & WORK PRACTICE CONTROLS

- Employers ***shall*** use engineering & work practice controls to limit exposures to or below the PEL
- Use such controls even if they do not reduce exposures to or below the PEL; **use controls to achieve the lowest feasible exposure level**
- Respirators ***shall*** supplement these controls when exposure levels are not reduced below the PEL

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HOUSEKEEPING – DRY SWEEPING/BRUSHING

Part 590 1910.1053(h)(1) & 690 1926.1153(f)(1)

- The employer **shall not allow dry sweeping or dry brushing** where such activity could contribute to employee exposure to RCS

Unless

- HEPA-Filtered Vacuuming, Wet Sweeping, or other methods that minimize the likelihood of exposure are not feasible
- Burden to prove infeasibility is on the employer

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HOUSEKEEPING

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HOUSEKEEPING – COMPRESSED AIR

Part 590 1910.1053(h)(2) & 690 1926.1053(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 RCS

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

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TASKS PERFORMED USING WET METHODS

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

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

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WHAT'S WRONG WITH THIS PICTURE?

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WHAT'S WRONG WITH THIS PICTURE?

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WHAT'S WRONG WITH THIS PICTURE?

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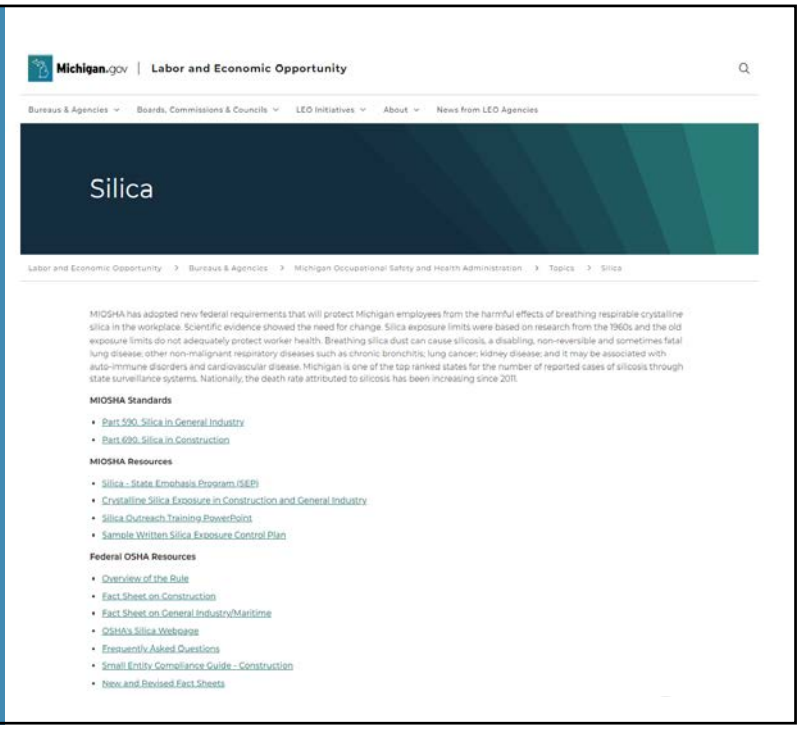
MIOSHA SILICA RESOURCES



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CET RESOURCES

For further information or to request onsite air monitoring call **517-284-7720**

or

Visit our website at **www.michigan.gov/miosha**

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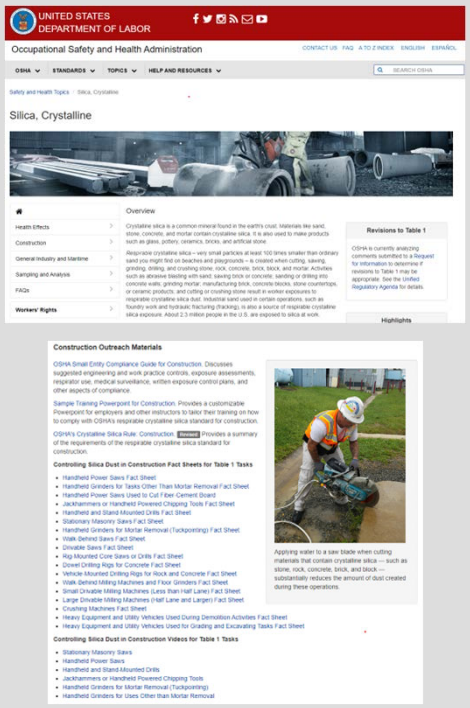

FEDERAL OSHA RESOURCES

Construction Face Sheets – Table 1 Tasks

- Handheld Power Saws Used to Cut Fiber-Cement Board
- Drivable Saws Fact Sheet
- Heavy Equipment and Utility Vehicles Used for Grading and Excavating Tasks Fact Sheet

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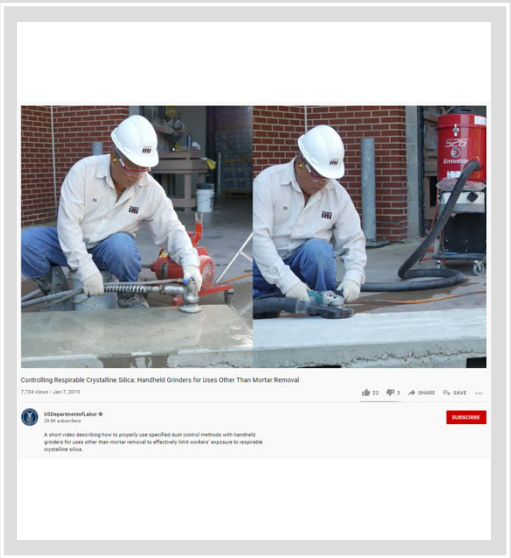

Note: Products featured in the videos are not necessarily an endorsement of the product.

OSHA RESOURCE VIDEOS – TABLE 1 TASKS

OSHA Videos on Controlling Silica Dust in Construction for Table 1 Tasks

- Stationary Masonry Saws
- Handheld Power Saws
- Handheld and Stand-Mounted Drills
- Jackhammers or Handheld Powered Chipping Tools
- Handheld Grinders for Mortar Removal (Tuckpointing)
- Handheld Grinders for Uses Other than Mortar Removal

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ADDITIONAL RESOURCES

MIOSHA & OSHA Resources

- Crystalline Silica Exposure in Construction and General Industry
- Sample Written Silica Exposure Control Plan
- Small Entity Compliance for Construction:

OSHA's Crystalline Silica Rule Fact Sheets:

- Fact Sheet on General Industry/Maritime
- Fact Sheet on Construction
- Table 1 Task Fact Sheets for Construction

NIOSH Silica Information Webpage

Center for Construction Research and Training

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QUESTIONS?

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ASSESSMENT

- The purpose of this assessment is to **validate the knowledge** learned in class.
- **Passing score of 70%** correct is required.
- **Class reference materials/books are not allowed** to be used during the assessment.
- **Collaboration/discussion with others is not allowed** during the assessment.
- Answers will be reviewed after everyone completes and submits their assessment.

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THANK YOU.

Don't Forget to Take the Survey

MIOSHA
Michigan Occupational Safety and Health Administration

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Silica Awareness

Student Resources

MIOSHA Standards:

- Part 590. Silica in General Industry
- Part 690. Silica in Construction

MIOSHA Resources:

- Crystalline Silica Exposure in Construction and General Industry
- Sample Written Silica Exposure Control Plan
- Silica – State Emphasis Program (SEP)

OSHA's Resources:

- Small Entity Compliance for Construction
- Fact Sheet on General Industry/Maritime
- Fact Sheet on Construction
- Table 1 Task Fact Sheets for Construction
- Handheld Power Saws Fact Sheet
- Handheld Grinders for Tasks Other Than Mortar Removal Fact Sheet
- Handheld Power Saws Used to Cut Fiber-Cement Board
- Jackhammers or Handheld Powered Chipping Tools Fact Sheet
- Handheld and Stand-Mounted Drills Fact Sheet
- Stationary Masonry Saws Fact Sheet
- Handheld Grinders for Mortar Removal (Tuckpointing) Fact Sheet
- Walk-Behind Saws Fact Sheet
- Drivable Saws Fact Sheet
- Rig-Mounted Core Saws or Drills Fact Sheet
- Dowel Drilling Rigs for Concrete Fact Sheet
- Vehicle-Mounted Drilling Rigs for Rock and Concrete Fact Sheet

- Walk-Behind Milling Machines and Floor Grinders Fact Sheet
- Small Drivable Milling Machines (Less than Half Lane) Fact Sheet
- Large Drivable Milling Machines (Half Lane and Larger) Fact Sheet
- Crushing Machines Fact Sheet
- Heavy Equipment and Utility Vehicles Used During Demolition Activities Fact Sheet
- Heavy Equipment and Utility Vehicles Used for Grading and Excavating Tasks Fact Sheet

OSHA Videos on Controlling Silica Dust in Construction for Table 1 Tasks

- Stationary Masonry Saws
- Handheld Power Saws
- Handheld and Stand-Mounted Drills
- Jackhammers or Handheld Powered Chipping Tools
- Handheld Grinders for Mortar Removal (Tuckpointing)
- Handheld Grinders for Uses Other than Mortar Removal

Other Resources

- NIOSH Silica Information Webpage: www.cdc.gov/niosh/topics/silica
- Center for Construction Research and Training: www.silica-safe.org

MIOSHA Training Institute (MTI) Resources:

www.michigan.gov/mti

MIOSHA Training Calendar:

www.michigan.gov/mioshatraining

MIOSHA Homepage:

www.michigan.gov/miosha

Michigan Department of Labor and Economic Opportunity
Michigan Occupational Safety and Health Administration
Consultation Education and Training Division
525 W. Allegan St., P.O. Box 30643
Lansing, Michigan 48909-8143

For further information or to request consultation, education, and training services
call 517-284-7720
or
visit our website at www.michigan.gov/miosha

www.michigan.gov/leo

LEO is an equal opportunity employer/program.