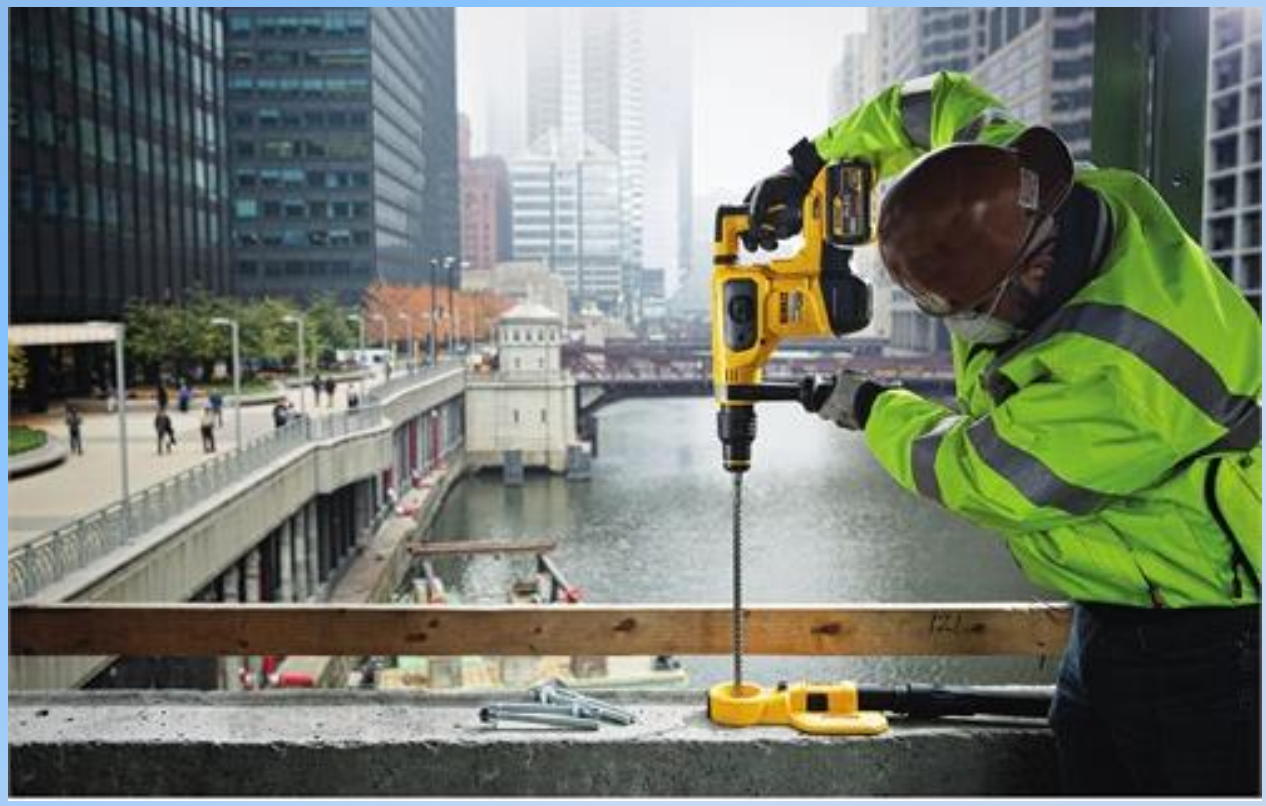
Respirable Crystalline Silica in Construction Workplaces



Sample Employee Training Presentation
Developed by OSHA, 2019

CONTROL SILICA DUST

Breathe Easier

Respirable Crystalline Silica in Construction Workplaces

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Photo on the title slide is courtesy of DEWALT Industrial Tool Co.

What You Will Learn





- What respirable crystalline silica is
- How employees may be exposed
- Health effects from breathing respirable crystalline silica

What You Will Learn



Photo courtesy of DEWALT Industrial Tool Co.

Silica standard



Workplace protections

What You Will Learn

Medical surveillance





Competent person

Crystalline Silica



Crystalline Silica Is Found In Many Construction Materials







Respirable Crystalline Silica



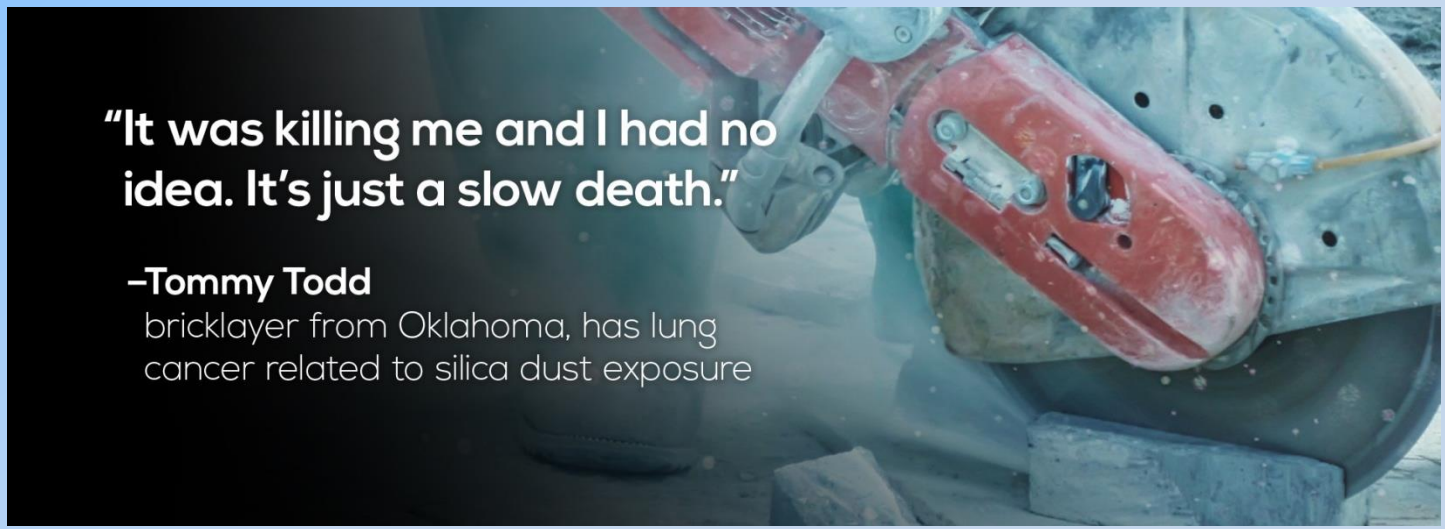


Workplace Tasks with Exposure

Employers must train employees on tasks in their workplace that may expose them to respirable crystalline silica

Health Hazards of Silica

- Silicosis
- Lung cancer
- Chronic obstructive pulmonary disease (COPD)
- Kidney diseases
- Autoimmune diseases



Health Hazards - Silicosis

- Three types:
  - Chronic
  - Accelerated
  - Acute
- Permanent
- Can be debilitating or deadly



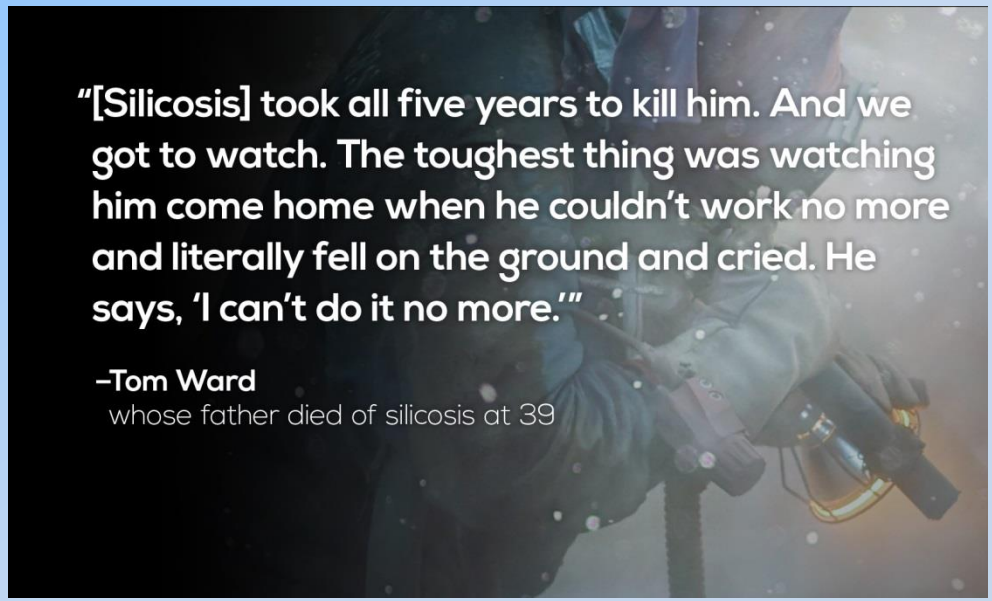
Healthy Lung



Silicotic Lung

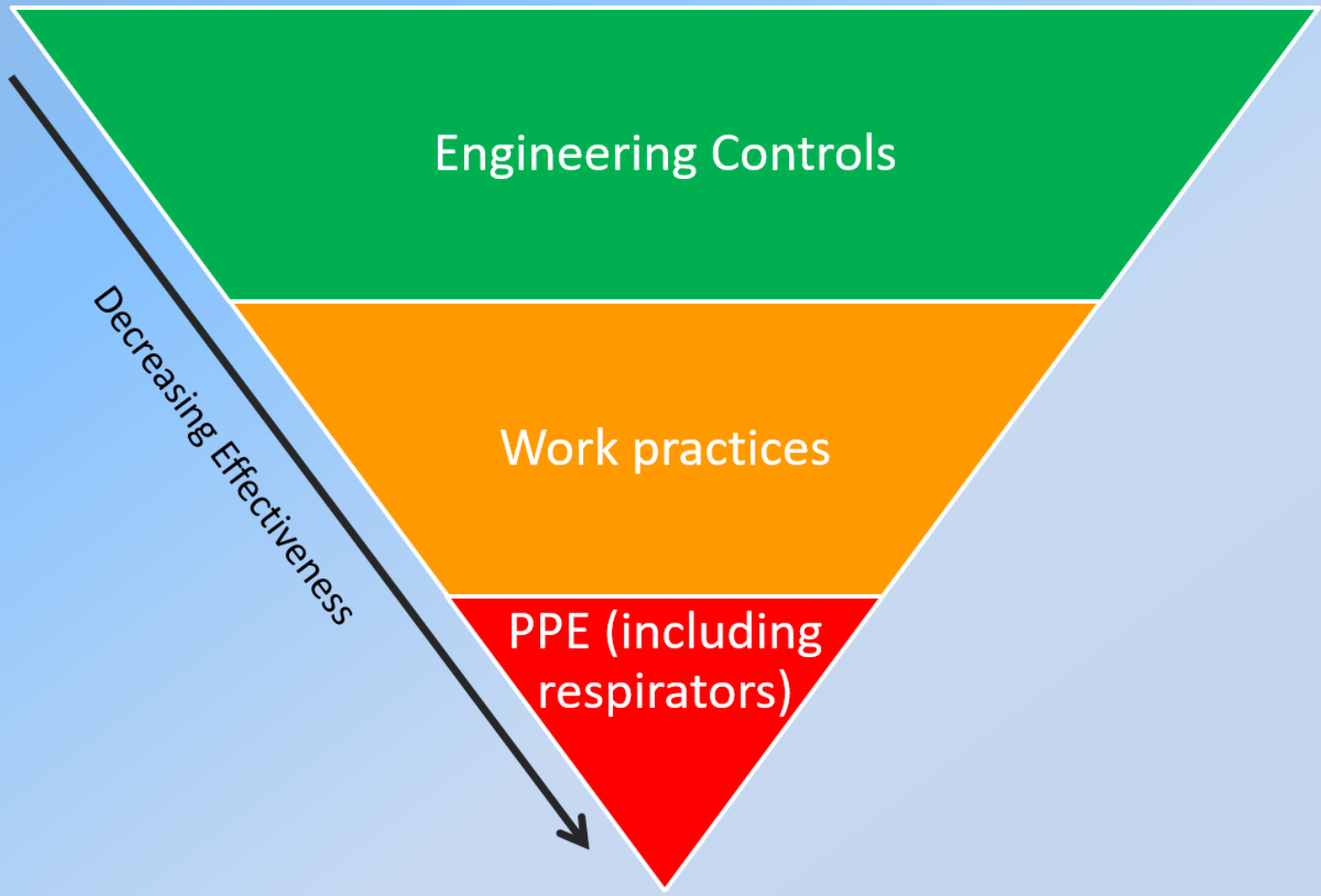
Symptoms of Lung Diseases

- Sometimes, no symptoms in early stage of disease
- Coughing and shortness of breath
- Fever, weight loss, exhaustion, and coughing up blood



Protecting Employees

Hierarchy of Controls



Engineering Controls

Cutting block
without engineering controls





Cutting block using water to
control the dust

Engineering Controls

Grinding mortar without engineering controls





Grinding mortar using a vacuum dust collector

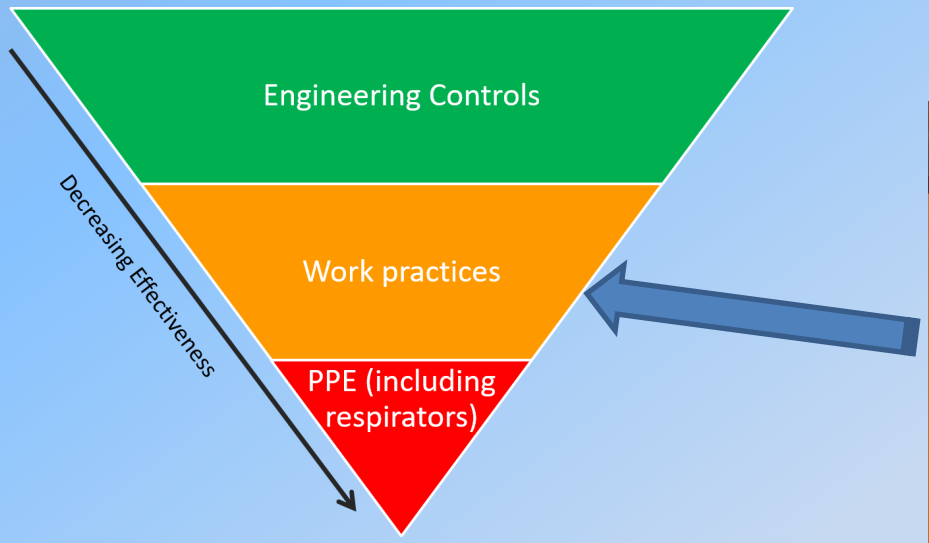
Engineering Controls

Employee protected inside the cab of heavy equipment used for demolition



Work Practice Controls

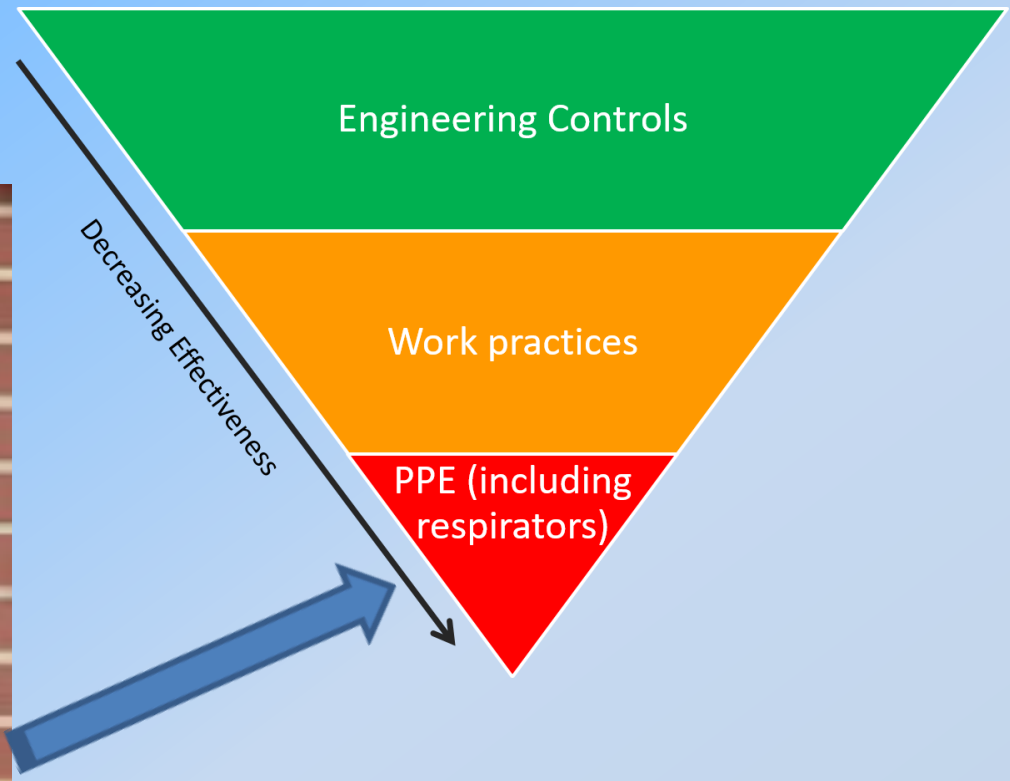
Example: Fixing controls that are not working properly





Respirators



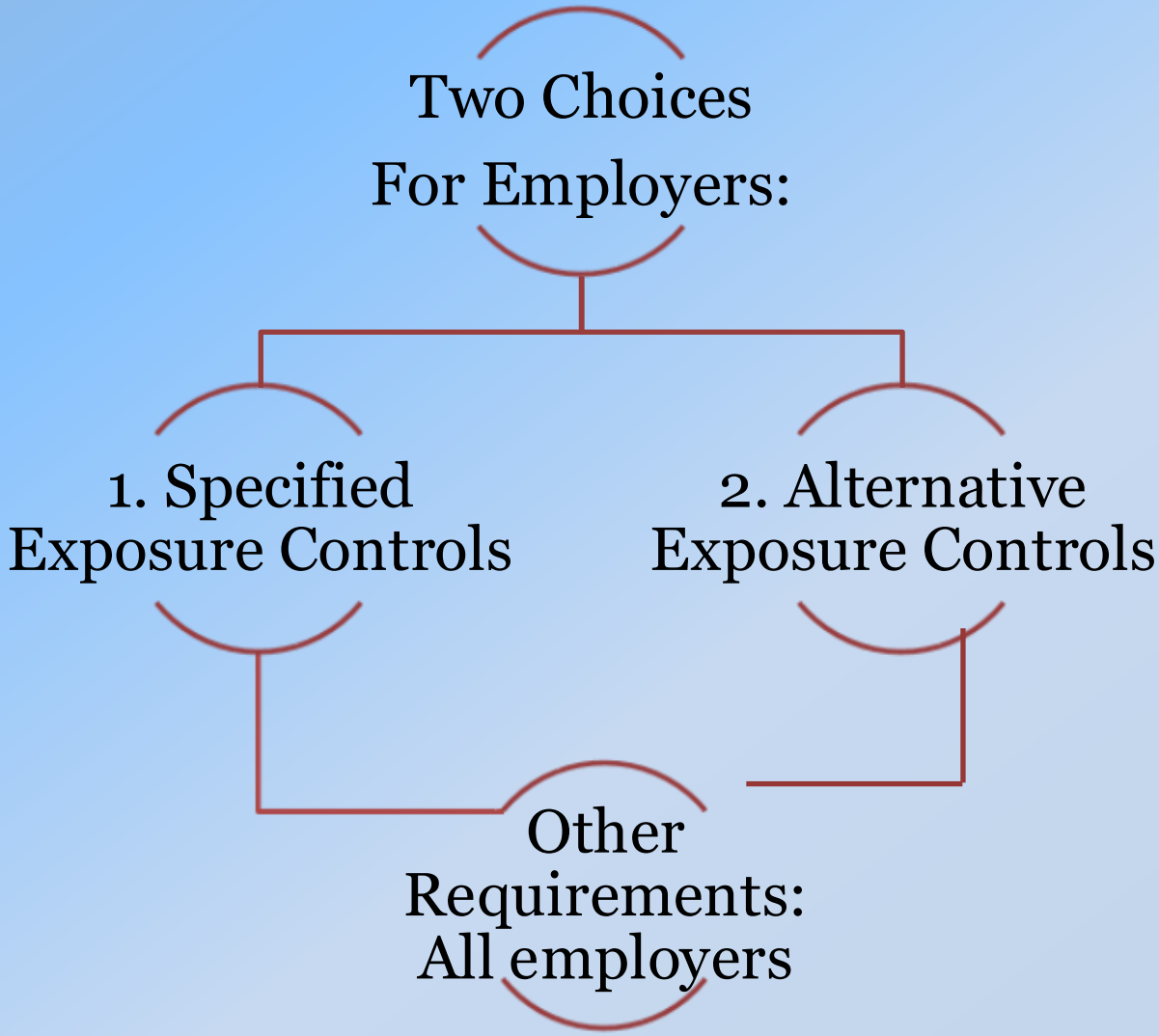


Specific Protections in This Workplace

Employers must train employees on workplace-specific:

- Engineering controls
- Work practice controls
- Respiratory protection

Respirable Crystalline Silica Standard for Construction



Specified Exposure Control Methods: Table 1

Table 1:
Handheld power saw



Table 1:
Handheld grinder for uses other than mortar removal



Example of a Table 1 Entry

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
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

Example of a Table 1 Entry

Equipment / 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)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturers' instruction to minimize dust - When used outdoors - When used indoors or in an enclosed area	None APF 10	APF 10 APF 10

List of Table 1 Entries

- Stationary masonry saws
- Handheld power saws
- Handheld power saws for fiber cement board
- Walk-behind saws
- Drivable saws
- 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
- Handheld grinders for mortar removal (tuckpointing)
- Handheld grinders for other than mortar removal
- 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
- Heavy equipment and utility vehicles for grading and excavating

Alternative Exposure Control Methods - Permissible Exposure Limit (PEL)

50 Micrograms per Cubic Meter of Air ($\mu g/m^3$)

Averaged over an 8-hour work day

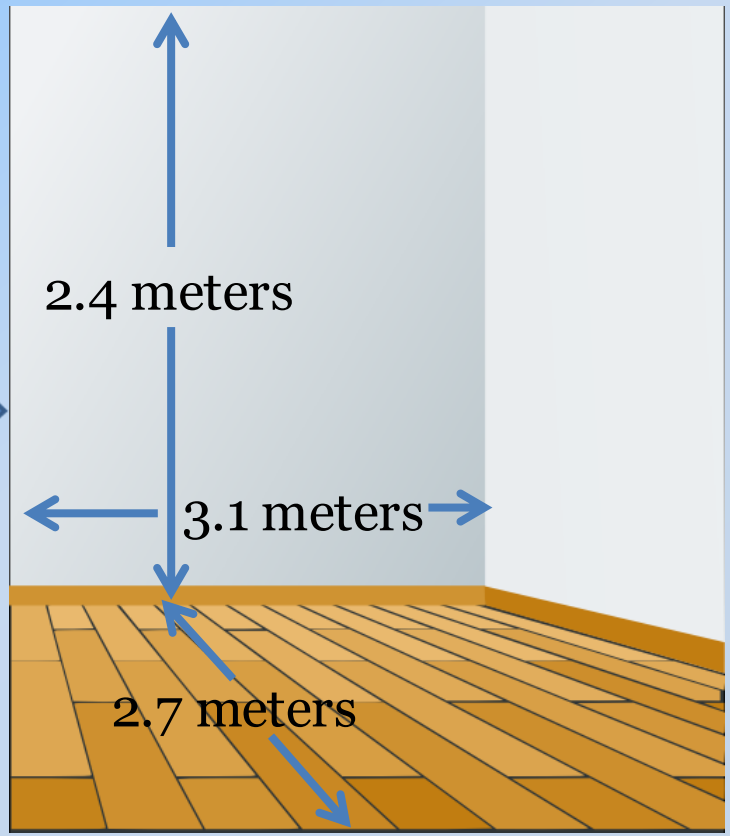
Perspective on PEL

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

1,000 µg of silica



20 cubic meters of air



Alternative Exposure Control Methods – Exposure Assessment

Employers must:

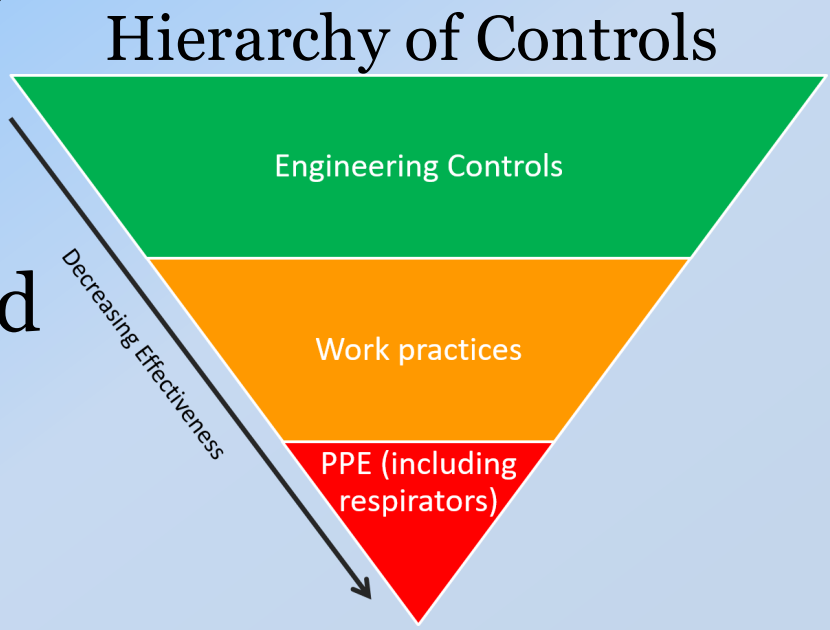
- Determine exposures
- Give employees results
- Let representatives observe



Alternative Exposure Control Methods – Methods of Compliance

Employers must select:

- Engineering controls
- Work practice controls
- Respirators, if needed



Respiratory Protection

Employers must:

- Provide respirators if needed
- Follow the respiratory protection standard



Housekeeping



When cleaning silica dust, avoid:

- Dry sweeping/brushing
- Compressed air without a ventilation system to capture the dust

Housekeeping

Employers must let employees know which housekeeping methods:

- Must be used in the workplace
- Must not be used in the workplace

Written Exposure Control Plan



Employers must:

- Prepare and implement plan addressing:
  - Exposure sources
  - Controls
  - Housekeeping
  - Restricting access
- Review plan yearly
- Make it available

Competent Person

- Identifies and minimizes silica hazards
- Employees must know the competent person



Morgan Zivertnik/Hoar Construction/elcosh.org

Medical Surveillance

- For employees who must wear a respirator under the silica standard for 30 or more days/year
  - Offered:
    - Within 30 days of assignment
    - Every three years



Medical Exams





- Medical and work history
- Physical exam
- X-rays

Medical Exams



Lung function test

Tuberculosis (TB test)



Why Medical Exams are Important



Find disease or increased sensitivity to silica exposure

Determine fitness to use respirator



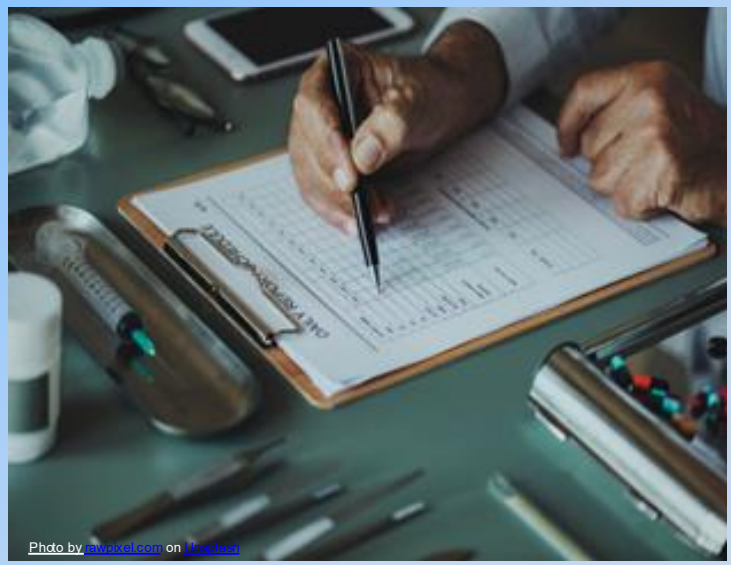
Medical Report for the Employee



- Medical conditions
- Recommended limitations on respirator use and exposure to silica
- Recommendation for specialist exam
- **Only goes to the employee**

Medical Opinion for the Employer

- Only medical info included:
  - Recommended respirator limitations



- Additional information requiring employee consent:
  - Recommended exposure limitations
  - Recommendation for specialist exam

Employee's Copy of the Employer's Written Medical Opinion



- Employees also get a copy
- Proof of exam for future employers

Exams at No Cost to Employees



Employer covers costs of:

- Exams
- Tests
- Time spent traveling and getting exam

Other Training

- Hazard communication program
- Respiratory protection program



Copy of the Standard



Employers must:

- Make a copy of the standard available to employees at no charge

Recordkeeping



Employers must:

- Keep medical and exposure records
- Make them available

More Information



www.osha.gov/silica/