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SILICA EXPOSURE CONTROL

Scope and Applicability Statement

This document provides general safety procedures and regulatory guidance for employers and workers in accordance with U.S. Occupational Safety and Health Administration (OSHA) standards under 29 CFR 1910.1053 (Respirable Crystalline Silica) and 29 CFR 1926.1153 (Silica in Construction). These procedures apply to all workplaces where they are implemented as part of a comprehensive safety program.

Customization and Compliance Statement

Employers are responsible for ensuring compliance with all applicable local, state, and federal safety regulations. Workers must adhere to established safety protocols to maintain a safe and healthy work environment.



Purpose

The purpose of this Exposure Control Plan (ECP) is to establish guidelines for protecting workers from harmful exposure to airborne silica dust. A combination of control measures will be required to achieve this objective, including engineering controls, administrative controls, and personal protective equipment (PPE).

Scope

This policy applies to all employees involved in tasks that may generate airborne silica dust. Contractors working on-site must follow their own written silica exposure control procedures or adopt this procedure.

Responsibilities

Employers:

- Identify tasks that may expose workers to respirable crystalline silica.
- Implement control measures such as wet methods, local exhaust ventilation (LEV), and substitution with less hazardous materials.
- Ensure availability of proper PPE, including respiratory protection.
- Conduct exposure monitoring to assess silica dust levels.
- Provide training on silica hazards and safe work practices.
- Maintain records of exposure monitoring, training, and medical evaluations.

Supervisors:

- Implement and enforce silica exposure control measures.
- Ensure employees are properly trained and use PPE as required.
- Conduct regular inspections to verify compliance.
- Report and document any silica exposure incidents.

Employees:

- Follow established work procedures to minimize silica dust exposure.
- Use assigned PPE properly and ensure it is maintained in good condition.
- Report unsafe conditions or deficiencies in control measures.
- Participate in required training and medical surveillance programs.

Silica-Containing Materials

Silica is a component of many common construction and industrial materials, including:

- Concrete, cement, and mortar



- Brick, tile, and stone (e.g., granite, sandstone)
- Asphalt containing rock or stone
- Abrasive blasting materials
- Fibrous cement board

High-risk activities include:

- Cutting, grinding, or drilling concrete, brick, or stone
- Tuckpoint grinding and abrasive blasting
- Road construction and demolition
- Sweeping or handling silica dust-contaminated materials

Health Hazards

Exposure to respirable crystalline silica can cause:

- **Silicosis:** A lung disease resulting from prolonged exposure to silica dust.
- **Lung Cancer:** Silica has been classified as a human carcinogen.
- **Chronic Obstructive Pulmonary Disease (COPD):** Long-term exposure may lead to reduced lung function.
- **Kidney Disease:** Some studies suggest a link between silica exposure and kidney damage.

Silicosis Types:

- Chronic Silicosis (10+ years of exposure at low levels)
- Accelerated Silicosis (5-10 years of exposure at high levels)
- Acute Silicosis (Short-term exposure at extremely high levels)

Exposure Control Measures

To minimize worker exposure, the following hierarchy of controls must be implemented:

- 1. Elimination/Substitution:**
 - Use alternative materials with lower silica content where feasible.
 - Modify work processes to reduce dust generation.
- 2. Engineering Controls:**
 - Utilize wet cutting methods to suppress dust at the source.
 - Install and maintain local exhaust ventilation (LEV) for grinding, drilling, or cutting.
 - Use enclosures or barriers to isolate work areas where dust is generated.
- 3. Administrative Controls:**



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- Rotate job assignments to reduce individual exposure duration.
- Post warning signs in silica-regulated areas.
- Establish housekeeping procedures (e.g., HEPA-filtered vacuums, wet sweeping).
- Schedule high-dust activities outside of normal work hours when possible.

4. **Personal Protective Equipment (PPE):**

- Provide NIOSH-approved respirators when engineering controls are insufficient.
- Workers must be clean-shaven to ensure an effective respirator seal.
- Use protective clothing to prevent silica dust contamination.

Respiratory Protection

- Employees exposed to silica levels above OSHA's Permissible Exposure Limit (PEL) of $50 \mu\text{g}/\text{m}^3$ over an 8-hour time-weighted average (TWA) must wear appropriate respirators.
- Respirators must be selected based on measured exposure levels and Assigned Protection Factors (APF).
- Workers must undergo fit testing and medical evaluations before using respirators.
- Self-contained breathing apparatus (SCBA) is required for high-exposure tasks.

Medical Surveillance

- Employees exposed at or above $25 \mu\text{g}/\text{m}^3$ (Action Level) for 30+ days per year must enroll in a medical surveillance program.
- Medical evaluations must include lung function testing and chest X-rays.
- Health monitoring records must be maintained for at least 30 years.

Training Requirements

- Employees must receive silica hazard training before beginning work that may expose them to airborne silica.
- Training must cover:
 - Health hazards and symptoms of silica-related diseases.
 - Proper use of engineering controls and PPE.
 - Safe work procedures and emergency response protocols.
- Refresher training must be provided as needed or when job conditions change.

Recordkeeping

Employers must maintain records of:

- Exposure assessments and air monitoring results.



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- Employee training records and attendance.
- Medical evaluations and surveillance data.
- Respirator fit testing and maintenance records.