

## **Safety & Risk Management Policies and Procedures**

**Title:** Silica Dust Policy - Exposure Control Plan

**Date:** June 2018

**Rationale:** OSHA published a new revised crystalline silica rule (1910.1053) requiring employers to determine if any employees may reasonably be exposed at or above the action level (AL) of 25 ug/m<sup>3</sup> for an 8hr TWA. Inhalation of crystalline silica (natural compound found in minerals/quartz) can cause serious lung disorders and/or diseases. Employees can be exposed to respirable silica dust when disturbing materials containing silica (dry clay mixing, pottery making/ceramics operations, cleaning ceramics studio surfaces, or maintenance/construction generated operations such as cutting, drilling, grinding concrete, masonry, stone or other material with silica/quartz content).

**Goals:** To develop an exposure control plan that will identify operations and tasks that may involve exposure to silica and develop controls that will protect employees. Specifically, to prevent exposure at or above the permissible exposure limit (PEL) of 50 ug/m<sup>3</sup> for an 8hr TWA.

**Policy and Procedures:** The OSHA silica dust standard requires employers to:

- Identify and describe tasks and operations that have potential for silica dust exposure.
- Conduct exposure assessment industrial hygiene monitoring to determine silica dust exposure based on task/operation.
- Protect employees from respirable crystalline silica exposures above the PEL (50ug.m3).
- Limit access to areas where employees may be exposed above the PEL.
- Implement engineering controls and work practice control measures to protect employees from silica exposure above the PEL.
- Establish and implement a written exposure control plan Restrict housekeeping practices that expose employees to silica dust.
- Train employees on health effects, workplace operations that can expose them to silica dust and on specific ways to limit their exposure.
- Offer medical exams and surveillance to employees exposed at or above the action level (25 ug/m<sup>3</sup> 8Hr TWA) for 30 or more days per year. Medical surveillance must be offered to employees who will be exposed at or above the action level for 30 or more days per year starting June 23, 2020. Medical surveillance must be offered to employees who will be exposed above the PEL for 30 or more days per year starting June 23, 2018.
- Provide respirators to employees when engineering and work practice controls cannot limit exposures below the PEL.
- Maintain records of silica exposure monitoring assessments, training and medical exams.

### **I. Written Exposure Control Plan - Ceramics**

#### **A. Description of operations and tasks that have the potential for silica dust exposure.**

**Operation/Task – Ceramics/Clay Making**

**Location: Studio Arts Building - ceramics studio.**

- Handling or transporting closed or opened bags of dry clay from delivery vehicle to stock shelves in clay stock area.
- Clay making operation - opening, scooping and mixing various bags and types of dry clay for clay making in the pug machine inside the clay mixing booth.
- Cleaning floors, tables, shelves, surfaces with clay/pottery dust and scraps in main ceramics studio, stock area as well as clay mixing booth.

When any of the identified tasks or other tasks that may cause exposure to silica dust are performed, Southwestern's Silica Dust Policy shall be implemented to protect employees from exposure to silica dust and associated adverse health effects.

**B. Description of engineering controls, work practices and respiratory protection developed to limit employee exposure to silica dust for each operation/task.**

**Operation/Task – Ceramics/Clay Making**

**Location: Studio Arts Building - ceramics studio.**

All dry clay mixing and dry clay making must be performed inside the clay mixing booth with the door closed (isolation/enclosure to limit exposure to other employees/students), the local exhaust ventilation unit running and respiratory protection worn (NIOSH Approved N95 or N99). Respirators properly fitted and worn can significantly reduce breathing silica dust particles and prevent silica dust related adverse health effects. At no time should the ceramics studio employees mix clay, open bags or engage in dry clay mixing/making unless the local exhaust ventilation unit is running properly. Clay bags shall be set on the bench directly under the local exhaust ventilation slots (after starting the fan) before opening and beginning the clay mixing/making process. Bags shall be closed, sealed and/or disposed very carefully to avoid spreading clay dust (silica). Respiratory protection should be worn prior to beginning any of the dry clay mixing/making operations. OSHA silica dust signs shall be posted on the door and inside the clay mixing booth as well as in the clay bag stock area to warn employees of the potential for silica dust exposure (OSHA hazard communication). Restricted access to the clay mixing booth shall be maintained by Studio Arts department faculty/staff. Studio Arts department faculty/staff shall issue an annual recurring work order to Facilities Management to ensure the effective operation of the local exhaust ventilation unit. Good personal hygiene shall be practiced to avoid unnecessary exposure to silica dust throughout the ceramics studio areas. Eating and drinking shall not be permitted in areas where ceramic (silica) dust is present.

**C. Description of housekeeping control measures developed and implemented to limit exposure to silica dust.**

Cleaning floors, tables, surfaces with ceramic dust/debris shall be conducted with wet wiping, wet sponging, wet mopping, wet hosing or dry HEPA filtered vacuuming. Dry HEPA filtered vacuuming is considered an effective method to clean and reduce exposure to silica dust.

No dry sweeping, dry brushing, dry mopping or use of compressed air is allowed or permitted in these areas due to significant potential for silica dust exposure.

Warning signage shall be posted to remind staff to follow wet cleaning or HEPA filtered vacuum housekeeping methods.

## II. Written Exposure Control Plan – Maintenance Operations

### Operation/Task – Maintenance/Construction related operations

#### Location: Campus Facilities

Maintenance/construction type operations that may involve cutting, drilling, grinding, crushing, sand blasting of concrete, cement, various masonry, rock or other materials that contain silica.

#### B. Engineering, work practice controls:

Use of water hoses, sprays – wetting surfaces continuously.

Use of tools with dust control systems (water on saws, drill bits etc.).

Vacuum tool methods with HEPA filters (vacuum shrouded tools).

Distance from source of dust generating operations.

Wear NIOSH Approved N95 or N99 respirator. Respirators properly fitted and worn can significantly reduce breathing silica dust particles and prevent silica dust related adverse health effects.

#### C. Housekeeping

No dry sweeping, dusting, blowing, etc. is allowed. Clean up area with wet methods, wet mopping, hosing or use a HEPA filtered vacuum to avoid silica dust exposure during clean-up operations.

### Silica Training Outline – Classroom – PP Presentation

Training for the Occupational Silica Dust Exposure will include the following topics:

1. Health hazards of silica dust exposure (including signs and symptoms of silicosis). (D)
2. Operations and materials that can produce silica dust exposure. (I,IIA)
3. Engineering and work practice controls used to protect them from exposures. (I, IIB)
4. The importance of proper equipment and control maintenance. (I, IIB)
5. Housekeeping procedures. (I, IIC)
6. Proper use of respirators and the respirator standard. (I, IIB)
7. Personal Hygiene procedures to reduce exposures. (I, IIB)
8. How smoking increases the risk of developing silicosis and other lung damage. (D)
9. The details of the Occupational Silica Dust Exposure Control Program. (this Silica Dust Policy)

#### D. Health Effects of Crystalline Silica

Silica is a main component of sand, rock and mineral ores. Inhaling fine particles of crystalline silica containing dusts has been associated with respiratory disease, most commonly silicosis. Additionally, there is evidence that exposure to crystalline silica-containing dusts causes or is associated with the following conditions: lung cancer, tuberculosis, chronic obstructive pulmonary disease (including emphysema and bronchitis), autoimmune diseases or immunologic disorders, chronic renal disease, and sub clinical renal changes [NIOSH, 2002]. The International Agency for Research on Cancer (IARC) has classified silica as a known human carcinogen (group 1). When fine particles of crystalline silica enter the lungs and are trapped, the lung tissue reacts by developing fibro tic nodules and scarring around the particles. As exposure continues and the condition worsens, the nodules become progressively larger and breathing becomes increasingly difficult.

This fibrotic condition of the lungs is called silicosis and it reduces the lungs ability to extract oxygen from the air. Eventually the worker may even die of respiratory failure. The body's natural defenses (mucous membranes of the nose and throat, etc.) filter out most of the particles above 5-10 microns in size from the air we breathe. Yet there is no mechanism to remove particles small enough to get deep into the lungs; these particles, such as silica, cannot be broken down by the body.

Symptoms of silicosis may not develop for many years but as the exposure continues symptoms appear such as shortness of breath with exertion (the most common symptom), coughing, and fever due to infectious disease of the lung (such as tuberculosis). Because these symptoms can be caused by a lot of things, silicosis is often misdiagnosed as bronchitis, emphysema, and tuberculosis. It is important however, to accurately identify silicosis, as the disease can only be stopped, not cured!

NIOSH has classified three types of silicosis:

- Chronic Silicosis.

Usually occurs after ten or more years of exposure to crystalline silica at relatively low concentrations. Shortness of breath, cough.

- Accelerated Silicosis.

Results from exposure to high concentrations of crystalline silica and develops five to ten years after the initial exposure. Shortness of breath, cough and sputum production.

- Acute Silicosis.

Is a rare disease caused by inhalation of extremely high levels of respirable crystalline silica. Can cause symptoms to develop within a few weeks, months or up to two years after the initial exposure. Sudden and progressive and very severe shortness of breath, fever, fatigue sputum, coughing up blood may also occur.

Not everyone will contract silicosis at the same rate if at all. The development of silicosis will depend on the following factors:

- Particle size: when the silica crystals are broken down into dust sized or respirable particles (smaller than 10 microns) they are small enough to be inhaled deep into the lungs and become deadly.
- Percentage of crystalline silica: the higher the percentage of crystalline silica present that is small enough to get deep into the lungs, the more damage that will occur.
- Length of exposure: the longer a person is exposed to respirable crystalline silica, the more likely they are to develop silicosis.
- Severity of exposure: the higher the concentration a person is exposed to the more likely they are to develop silicosis.
- Individual susceptibility: certain individuals will be more prone to develop silicosis and its associated complications due to the person's health.

Smoking: smoking increases a person's chance to contract silicosis by inhibiting the ability to filter particles out of the air before they reach the lungs.

Safety & Risk Management Policies and Procedures  
Silica Dust Policy and Exposure Control Plan

Date:

Approved (signature and date):

Supervisor \_\_\_\_\_

Director of Physical Plant \_\_\_\_\_

AVP for Facilities \_\_\_\_\_

Vice President for Fiscal Affairs If needed \_\_\_\_\_

Copy:

All supervisors \_\_\_\_\_

Related crafts \_\_\_\_\_

Department Heads \_\_\_\_\_

VP's \_\_\_\_\_

President \_\_\_\_\_