State of Iowa Department of Corrections

Policy and Procedures

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Authority:

1. PURPOSE

To implement a written exposure control plan to be utilized by the Iowa Department of Corrections (IDOC) to eliminate or reduce the hazards associated with silica.

2. POLICY

It is the policy of the IDOC to follow OSHA Standard 1926.1153, Toxic and Hazardous Substances, Respirable Crystalline Silica and the conditions set forth in this policy. The standard (29 CFR 1926.1153) requires employers to limit worker exposures to respirable crystalline silica and to take other steps to protect workers.

CONTENTS

3. DEFINITIONS- As used in this document

A. Action Levels - Used to express a health or physical hazard. They indicate the level of a harmful or toxic substance/activity which requires medical surveillance and increased industrial hygiene monitoring. Action level with regards to silica means a concentration of airborne respirable crystalline silica of 25 µg/m3, calculated as an 8-hour TWA.

B. Competent Person - An individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them.

C. Crystalline Silica - A common mineral found in the earth's crust. Materials like sand, stone, concrete, and mortar contain crystalline silica.

D. Engineering Controls - A method to eliminate or reduce exposure to a chemical or physical hazard through the use or substitution of engineered machinery or equipment.

E. Employee Exposure - The exposure to airborne respirable crystalline silica that would occur if the employee were not using a respirator.

F. Health Hazards from Exposure - Inhaling crystalline silica can lead to serious illnesses including silicosis, lung cancer, tuberculosis, and chronic obstructive pulmonary disease (COPD).

G. High-Efficiency Particulate Air [HEPA] Filter - A filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter.

H. Integrated Water Delivery System (Wet Cutting) - A system that continuously feeds water to the blade to prevent dust exposure.

I. Respirable Crystalline Silica – Very small particles at least 100 times smaller than ordinary sand you might find on beaches and playgrounds – is created when cutting, sawing, grinding, drilling, and crushing stone, rock, concrete, brick, block, and mortar. Activities such as abrasive blasting with sand; sawing brick or concrete; sanding or drilling into concrete walls; grinding mortar; manufacturing brick, concrete blocks, stone countertops, or ceramic products; and cutting or crushing stone result in worker exposures to respirable crystalline silica dust.

J. Permissible Exposure Limit (PEL) - A legal limit for exposure of an employee to a chemical substance or physical agent such as loud noise. Permissible

exposure limits are established by the Occupational Safety and Health Administration (OSHA).

K. Slurry - A semiliquid mixture, typically of fine particles of manure, cement, or coal suspended in water.

L. Table 1- OSHA's specified exposure control methods when working with materials containing crystalline silica

M. Work Practice Controls- Procedures that reduce the likelihood of exposure by altering the way in which a task is performed (e.g., prohibiting mouth pipetting and recapping of needles).

N. Vacuum Dust Control System (VDCS) - A vacuum system used to control dust

4. PROCEDURES

A. TABLE 1

1. The IDOC will utilize Table 1 to identify designated tasks and approved work practice control methods.

   Table 1 - specified exposure control methods when working with materials containing crystalline silica, see **IO-SE-02 Attachment A**.

2. Some tasks that involve occasional brief exposure to respirable crystalline silica fall under the short duration guidelines. If the duration of exposure is 15 minutes or less, the 8-hour TWA exposure can reasonably be anticipated to remain under the threshold assuming there is no other exposure the remainder of the shift.

3. Where an employee performs more than one task on Table 1 during the course of an 8-hour 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.

B. Engineering and Work Practice Controls

1. Integrated Water Delivery System

a. Water will be supplied to the equipment either by a pressurized container or by a constant water supply such as a hose connected to a faucet or site water supply. Water flow rates must be sufficient to minimize release of visible dust.

b. The appropriate water flow rates for controlling silica dust emissions can vary. IDOC staff will follow manufacturers' instructions when determining the required flow rate for dust suppression systems on a given worksite

c. Each institution will determine the appropriate water flow rate prior to starting work when wet cutting is used.

d. Equipment equipped with an integrated water delivery system can be used to control dust when cutting, grinding, or polishing granite, concrete or other materials containing crystalline silica outdoors.

e. A water faucet or pressurized container can be used to supply a constant spray of water to the grinding wheel.

f. When used outdoors, water fed grinders can control dust on uneven surfaces and near corners and edges more effectively than vacuum dust collection systems.

g. When working in cold temperatures, where there is a risk of water freezing, additional work practices such as insulating drums, wrapping drums with gutter heat tape or adding environmentally-friendly antifreeze.

h. Ensure airflow is not impeded by the movements of employees during work, or by the opening or closing of doors and windows. Position the ventilation to move contaminated air away from the workers' breathing zones.

i. Check that hoses are securely connected and are not cracked or broken.

j. Adjust nozzles so that water goes to the blade and wets the cutting area.

k. Inspect the saw blade before use to be sure it is in good condition and does not show excessive wear.

l. Maintain and operating the saw's dust-control equipment based on the manufacturer's instructions.

    1) Extra ventilation or a means of exhaust may be needed to reduce visible airborne dust in enclosed areas.

    2) Extra ventilation can be supplied by using:

        a) Exhaust trunks

        b) Portable exhaust fans

        c) Air ducts

        d) Other means of mechanical ventilation

2. Dust Collection System

When IDOC staff utilize VDCS, staff will ensure the requirements set forth in Table 1 are followed. In addition, the following will occur:

a. Follow the equipment manufacturer's directions on how to reduce dust build-up on the filter. Change vacuum-collection bags as directed by the manufacturer.

b. Do not overfill the bag.

c. Set a regular schedule for maintenance and filter cleaning of the VDCS.

d. Avoid exposure to dust when changing vacuum bags and cleaning or replacing air filters.

e. Turn the vacuum off and on regularly to reduce dust build-up on the filter, if it is not self-cleaning.

f. Disposing of dust bags and filters in sealed, impermeable contains such as heavy gauge plastics bags to prevent the release of dust particles into the air.

3. Method of Compliance

a. The designated Safety Officer at each facility and the IDOC Safety Director will be considered the competent person for the purpose of complying with the OSHA Standard.

b. Each facility shall outline specific tasks in the workplace that may involve exposure.

c. Each facility shall include procedures to limit access to work areas where exposure is possible.

4. Clean Up

a. Clean up of slurry (wet dust) - Slurry generated by wet methods should be cleaned up before it dries using a wet vacuum. When emptying the vacuum, the slurry will be transferred into a plastic bag and placed inside a container for disposal.

b. Use of Compressed Air - Do not use compressed air or blowers to clean surfaces, clothing or filters because it can increase exposure to silica. Instead, clean only with a HEPA filter equipped vacuum or by wet methods.

c. Clothing - Clothing that has been contaminated with silica dust must be washed separately from other clothing. Each institution will develop a procedure to handling uniforms contaminated with silica.

d. Dry sweeping is prohibited.

C. Health Hazards

1. Workers who inhale these very small crystalline silica particles are at increased risk of developing serious silica-related diseases, including:

a. Silicosis, an incurable lung disease that can lead to disability and death;

b. Lung cancer;

c. Chronic obstructive pulmonary disease (COPD); and

d. Kidney disease.

2. The IDOC will make medical surveillance available for each employee who will be required to use a respirator for 30 or more days per year.

   Each facility will ensure their procedure addresses how to track the 30 days.

D. Training

See **IO-SE-03,** *General Health and Safety Management* for training requirements.