Silica – The Dangers of Silica

WHAT'S AT STAKE?

Many common construction work tasks generate harmful levels of crystalline silica dust if proper controls are not followed. When silica dust builds up in your lungs, you are at risk of developing a serious lung disease called silicosis, which can lead to death. Silicosis is not curable, but it is preventable.

WHAT'S THE DANGER?

What is Silica?

Silica is the basic component of sand and rock. Some common silica-containing materials include:

- Concrete, concrete block, cement and mortar
- Masonry and tiles
- Brick, refractory brick
- Composite products such as Hardiplank
- Granite, sand, fill dirt, top soil
- Asphalt containing rock or stone
- Abrasive used for blasting

You may be exposed to silica when working with or around these materials.

EXPOSURE RISKS

The cutting, breaking, crushing, drilling, grinding, or abrasive blasting of these materials without proper controls will produce fine silica dust. You can't see dust particles but that does not mean there isn't silica in the air. Silica particles can hang around for an entire work shift without being visible to the naked eye.

If you do one of the following activities, you are at risk of breathing silica dust:

- Chipping, sawing, grinding, hammering, and drilling of rock, concrete, or masonry
- Crushing, loading, hauling, and dumping of rock
- Sawing, hammering, drilling, grinding, and chipping of concrete or masonry
- structures
- Demolition of concrete or masonry structures
- Power cutting or dressing stone
- Abrasive blasting and hydro blasting of concrete
- Clean-up activities such as dry sweeping or pressurized air blowing of
- concrete or sand dust
- Tunneling, excavation, and earth moving of soils with high silica content

What Happens When Someone Breathes in Silica Dust?

Silicosis is a type of lung disease that occurs when silica dust is inhaled. The dust contains tiny shrapnel like particles of crystallized silica that cause tiny tears in your lung tissue, resulting in patches of scar tissue when the tear is repaired by your body. Some who have been exposed to silica in high concentrations experience symptoms in a few weeks, or gradually get symptoms with smaller exposures over 4-10 years.

HOW TO PROTECT YOURSELF

The employer has the fundamental obligation to provide a safe work environment.

Identify Materials That May Contain Silica

For some materials, the employer can look at a Safety Data Sheet (SDS) or contact the manufacturer to determine if a product contains silica. For other materials such as rock, soil and concrete there may not be an SDS. When that’s the case assume that the material contains silica unless testing shows otherwise.

Identify Activities That Create Dust

Review your operation to determine where employee exposures to silica dust may be occurring. Be sure to include cleaning and maintenance activities. These tasks, even if they take less time or are done less frequently, often expose employees to large amounts of dust.

Provide Protective Clothing and Hygiene Facilities

Protective clothing and proper hygiene not only protects employees on the job, they also prevent workers from bringing home toxic materials. To protect workers and their families, employers should:

- Provide washing facilities at the worksite
- Ensure workers wash before eating, drinking, or smoking and before leaving the workplace.
- Prohibit food, drink, and tobacco products in areas where silica dust is present.
- Provide disposable or washable work clothes.
- Ensure that workers change into clean clothes before leaving the worksite.

Ensure Proper Housekeeping

Proper housekeeping practices include the following:

- Use HEPA-filtered vacuum cleaners or water for cleaning up equipment or surfaces.
- Prohibit the use of compressed air for cleaning equipment, surfaces, and clothing.
- Prohibit dry sweeping and shoveling.

Control Exposures

Exposures to silica dust can be eliminated or reduced using one or more of the following methods:

Substitution: The best way to eliminate exposure to silica is to use an alternative, less toxic substance.

Engineering and Work Practice Controls: In many cases, it is impossible to eliminate or find a substitute for silica. The next

best solution is the use of engineering and work practice controls. Examples of these control methods include:

- Enclose the process
- Enclose the worker
- Use wet methods
- Use local exhaust ventilation
- Institute procedures and work practices that minimize the amount of dust produced

Respiratory Protection

Occupational health and safety professionals (and Cal/OSHA) consider respirators a control method of last resort, rather than a preferred means of protecting employees. However, sometimes respiratory protection is appropriate, as in the following circumstances:

- During the time needed to implement engineering and work practice controls.
- If engineering and work practice controls do not reduce exposures sufficiently.
- For operations where engineering and work practice controls are not feasible, such as some maintenance and repair activities.

Written Respiratory Protection Program

When respirators are used to prevent overexposures, a written Respiratory Protection Program is needed. The elements of this program include:

    - Appropriate respirator selection
    - Medical evaluation to determine the ability of a worker to use a respirator
    - Annual face seal fit-testing
    - Procedures for routine and emergency use
    - Respirator inspection, cleaning, disinfecting, maintenance, storage, and repair
- Air quality for supplied-air devices

- Annual employee training
- Periodic program evaluation

Monitor the Air Employees Breathe

How do you know if your workers are breathing too much silica dust? Air monitoring by a trained professional, such as an industrial hygienist, can determine the level of silica exposure in your workplace. By knowing if and where employees are overexposed, you can allocate your resources wisely and put control measures in place where they are needed.

FINAL WORD

Common methods and best practices for eliminating or reducing exposure are a combination of dust suppression, erecting barriers, and PPE. Some of the controls come in forms of continuous water spray, HEPA vacuums, dust caps, tape barriers, and full enclosure systems sometimes including negative air units. PPE could include tyvek suits, eye and hand protection and respirators. PPE should be your last line of defense in protecting yourself.