Silica Exposure Safety Talk

WHAT’S AT STAKE?

RESPIRABLE CRYSTALLINE SILICA (SILICA DUST)

Millions of U.S. workers are exposed to respirable crystalline silica in a variety of industries and occupations, including construction, sandblasting, and mining. Silicosis, an irreversible but preventable disease, is the illness most closely associated with occupational exposure to the material, which also is known as silica dust. Occupational exposures to respirable crystalline silica are associated with the development of silicosis, lung cancer, pulmonary tuberculosis, and airways diseases. These exposures may also be related to the development of autoimmune disorders, chronic renal disease, and other adverse health effects.

WHAT’S THE DANGER?

KNOW THE HAZARD

Workers may be exposed to dangerous levels of silica dust when cutting, drilling, grinding, or otherwise disturbing materials that contain silica. These materials and tasks are common on construction and oil and gas jobs. Breathing that dust can lead to serious, often fatal illnesses. Workers – and contractors – need to recognize the hazard, understand the risk factors, and work safely with silica.

Silica is the basic component in sand and rock construction materials:

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

THE RISKS / POTENTIAL HEALTH EFFECTS OF SILICA

Inhaling silica dust can cause silicosis, a serious and irreversible lung disease. It can be lethal. Silica damages the lung and causes scar tissue to form. This causes the lung tissue to become thicker. Silica exposure can also cause lung cancer.

It is possible to have silicosis without showing any symptoms at first. The longer workers have been exposed to silica dust, the worse the symptoms will become. As the disease progresses workers may show noticeable symptoms such as:

- Shortness of breath
- Severe coughing
- Body weakness

Silicosis is classified into three types: chronic/classic, accelerated, and acute.

Chronic/classic silicosis, the most common, occurs after 15–20 years of moderate to low exposures to respirable crystalline silica. Symptoms associated with chronic silicosis may or may not be obvious; therefore, workers need to have a chest x-ray to determine if there is lung damage. As the disease progresses, the worker may experience shortness of breath upon exercising and have clinical signs of poor oxygen/carbon dioxide exchange. In the later stages, the worker may experience fatigue, extreme shortness of breath, chest pain, or respiratory failure.

Accelerated silicosis can occur after 5-10 years of high exposures to respirable crystalline silica. Symptoms include severe shortness of breath, weakness, and weight loss. The onset of symptoms takes longer than in acute silicosis.

Acute silicosis occurs after a few months or as long as 2 years following exposures to extremely high concentrations of respirable crystalline silica. Symptoms of acute silicosis include severe disabling shortness of breath, weakness, and weight loss, which often leads to death.

MAIN ROUTES OF EXPOSURE OF SILICA

- **Inhalation:** At high concentrations: can irritate the nose and throat.
- **Skin Contact:** Not irritating.
- **Eye Contact:** May cause slight irritation as a “foreign object”. Tearing, blinking and mild temporary pain may occur as particles are rinsed from the eye by tears.
- **Ingestion:** Not harmful.
- **Effects of Long-Term (Chronic) Exposure:** VERY TOXIC. Can cause lung damage if the dust is breathed in. Symptoms may include shortness of breath, chronic cough and weight loss. There may be a decrease in lung function and ability to do some physical activities. In severe cases, there can be effects on the heart and death from heart failure.
- **Carcinogenicity:** Known to cause: lung cancer.

Health impacts of exposure

When very small (respirable) silica dust particles are inhaled they can penetrate deep into the lungs and cause disabling and sometimes fatal diseases of the lung and kidney. When a person inhales crystalline silica, the lungs react and develop scarring and hardening around the trapped silica particles, resulting in a disease called silicosis. Silicosis is a disabling, irreversible, and sometimes fatal lung disease for which there is no cure. Since silicosis affects lung function, it makes you susceptible to lung infections such as tuberculosis. For smokers this is more hazardous, as smoking damages the lungs and adds to the damage caused by breathing silica dust. The other bad news is that crystalline silica is also a known carcinogen which means it can cause lung cancer.

HOW TO PROTECT YOURSELF

Elimination or substitution

Eliminating the hazard by substituting a safer process or material, where possible, is the most effective control.

Engineering controls

Making physical modifications to facilities, equipment, and processes can reduce exposure.

Administrative controls

These involve changing work practices and work policies. Providing awareness tools and training also count as administrative controls. All can limit the risk of silica dust exposure.

Personal protective equipment

This is the least effective control. When used, there must always be at least one other control in place as well.

FIRST AID MEASURES FOR SILICA

Inhalation: Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move victim to fresh air.

Skin Contact: Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with lukewarm, gently flowing water and non-abrasive soap for 5 minutes.

Eye Contact: Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. If irritation or pain persists, see a doctor.

Ingestion: Have victim rinse mouth with water. Call a Poison Centre or doctor if the victim feels unwell.

First Aid Comments: If exposed or concerned, see a doctor for medical advice. All first aid procedures should be periodically reviewed by a doctor familiar with the chemical and its conditions of use in the workplace.

Note to Physicians: Some jurisdictions specifically regulate an ingredient of this product and require a complete medical surveillance program. Specific information should be sought from the appropriate government agency in your jurisdiction.

FINAL WORD

The industrial barons and titans for most of this century took a devastating toll on workers due to their reckless disregard of safety in silica operations. The numbers of dead and seriously afflicted workers tell the tale. The tide has shifted towards other sources of material and elimination of the deadly hazards of silica in our workplaces.