# KAHNCO, LLC T/A KAHN COMPANY

# SILICA SAFETY PLAN

**Purpose**

The purpose of an exposure control plan (ECP) is to set out KAHNCO, LLC's approach to protecting workers from harmful exposure to airborne silica dust.

A combination of control measures may be required to achieve this objective. We commit to being diligent in our efforts to select the most effective control technologies available, and to ensure that the best practices, as described in this ECP, are followed.

The work procedures we establish will protect not only our employees but other possible effected personal. These guidelines are designed to be used as per project when the need for a control plan may exist.

**Key Responsibilities**

Due to the significant risk posed by respirable silica, it is critical that all personnel involved in operations that could potentially create silica dust take specific action to ensure that, as much as possible, a hazard is not created.

The company is responsible for:

• Substitution of less hazardous products for those that contain crystalline silica is required.
• Ensuring that the materials (e.g., tools, equipment, personal protective equipment) and other resources (i.e., employee training materials) required to fully implement and maintain this exposure control plan (ECP) are readily available where and when they are required.
• Providing a job-specific ECP for each project as need warrants; which outlines in detail the work methods and practices that will be utilized. Considerations for the plan should include:
• Availability and delivery of all required tools/equipment
• Scope and nature of grinding work to be conducted • Control methods to be used and level of respiratory protection required • Coordination plan • Conducting a periodic review of the effectiveness of the ECP. This would include a review of the

available dust-control technologies to ensure these are selected and used when practical.
• Initiating sampling of worker exposure to concrete dust when there are non-standard work practices for which the control methods to be used have not been proven to be adequately protective.
• Ensuring that all required tools, equipment, and personal protective equipment are readily available and used as required by the ECP.
• Ensuring supervisors and employees are educated and trained to an acceptable level of competency.
• Maintaining records of training, fit-test results, crew talks, and inspections (equipment, PPE,work methods/practices).
• Coordinating the work with the prime contractor and other employers to ensure a safe work environment.

The supervisor/foreman is responsible for:

• Obtaining a copy of the ECP from the employer, and making it available at the worksite
• Selecting, implementing, and documenting the appropriate site-specific control measures
• Providing adequate instruction to workers on the hazards of working with silica-containing materials and on the precautions specified in the job-specific plan covering hazards at the location
• Ensuring that workers are using the proper respirators and have been fit-tested
• Directing the work in a manner that ensures the risk to workers is minimized and adequately controlled
• Communicating with the prime contractor and other sub-contractors to ensure a safe work environment

The employee is responsible for:

• Knowing the hazards of silica dust exposure
• Using the assigned protective equipment in an effective and safe manner
• Setting up the operation in accordance with the site-specific plan
• Following established work procedures as directed by the supervisor
• Reporting any unsafe conditions or acts to the supervisor
• Knowing how and when to report exposure incidents

## Silica Properties

Silica is the second most common mineral on earth and makes up nearly all of what we call “sand” and “rock.” Silica exists in many forms—one of these, “crystalline” silica (including quartz), is the most abundant and poses the greatest concern for human health. Some common materials that contain silica include:

- Rock and sand
- Topsoil and fill
- Concrete, cement, and mortar
- Masonry, brick, and tile
- Granite, sandstone, and slate
- Asphalt (containing rock and stone)
- Fibrous-cement board containing silica

Silica is a primary component of many common construction materials, and silica-containing dust can be generated during many construction activities, including:

- Abrasive blasting (e.g., of concrete structures)
- Jackhammering, chipping, or drilling rock or concrete
- Cutting brick or tiles
- Sawing or grinding concrete
- Tuck point grinding
- Road construction
- Loading, hauling, and dumping gravel
- Demolition of structures containing concrete
- Sweeping concrete dust

Unprotected employees performing these activities, or working in the vicinity, can be exposed to harmful levels of airborne silica. Workers in other industries can also be exposed to silica, for example in the manufacture of toothpaste or pottery, or when loading coal (which can contain quartz) into the hold of a ship.

## Health Hazards

Exposure to silica has been shown to cause silicosis, lung cancer, pulmonary tuberculosis and other airway diseases. Crystalline silica dust can cause a

disabling, sometimes fatal disease called silicosis. The fine particles are deposited in the lungs, causing thickening and scarring of the lung tissue. The scar tissue restricts the lungs' ability to extract oxygen from the air. This damage is permanent, but symptoms of the disease may not appear for many years.

A worker may develop any of three types of silicosis, depending on the concentrations of silica dust and the duration of exposure:
• Chronic silicosis—develops after 10 or more years of exposure to crystalline silica at relatively low concentrations
• Accelerated silicosis—develops 5 to 10 years after initial exposure to crystalline silica at high concentrations
• Acute silicosis—develops within a few weeks, or 4 to 5 years, after exposure to very high concentrations of crystalline silica

Initially, workers with silicosis may have no symptoms; however, as the disease progresses, a worker may experience:
• Shortness of breath
• Severe cough
• Weakness
These symptoms can worsen over time and lead to death. Exposure to silica has also been linked to other diseases, including bronchitis, tuberculosis, and lung cancer.

**Best Practices**
The company has developed a best practice governing the storage, handling, use and disposal of silica if there is potential for exposure.
The best practice includes measures to be used to prevent the uncontrolled release of silica and the procedures to be followed if there is an uncontrolled release.
Engineering controls such as ventilation or wet methods will be used to control silica-containing dusts.

**Risk Identification, Assessment and Control**
The potential for employee exposure to silica should be identified during the hazard assessment. A worker's exposure to silica is kept as low as reasonably achievable. Employees must not be exposed to airborne concentrations of silica in

excess of 0.025 mg/cubic meter over an 8 hour time period. Atmospheric testing results should be assessed before a employee is exposed.

A key step in developing a silica exposure control plan is to identify the work activities that would put employees at risk of exposure.

• Work activities — that may generate airborne silica dust—for silica, the route of exposure is through the inhalation of airborne dust. The employer should have a qualified person review the planned work activities to identify those that may generate airborne silica.
• Identify workers at risk of exposure—For example, workers who finish concrete would be at greater risk of exposure than plumbers or electrical workers.
• Amount of exposure—some work activities generate more dust than others, and the amount of exposure should be estimated. Published resources are available that provide air sampling data and compare silica dust levels from various construction activities.
• Duration of exposure—employees who grind concrete for a full shift would be at greater risk than employees jackhammering for an hour.

**Control Options**

Effective control options must be used to eliminate or reduce the risk to employees from the hazards of silica dust exposure. The following hierarchy of control measures must be followed:
• Elimination/substitution (e.g., using products with less silica or using work methods that would eliminate the need for surface grinding)
• Engineering controls (e.g., water, local exhaust ventilation, enclosure)
• Administrative controls (e.g., coordination of tasks with subcontractors, signage)
• The use of proper PPE such as gloves, coveralls and eye protection when exposed to silica. Personal protective equipment such as gloves, coveralls and eye protection will be used to control silica exposures.

The company commits to developing knowledge and expertise about these controls, and to establishing policies/procedures to protect workers from harmful exposure and to minimize reliance on respirators. Effective engineering controls

such as HEPA vacuum attachments and wetting methods, which control silica dust at its source, are readily available. These controls have been proven to reduce airborne dust levels significantly when selected and operated in accordance with best practices. Engineering controls alone may not reduce airborne silica to safe levels; so in some cases other control measures, including respiratory protection, will be necessary.

The company will reduce or eliminate employee exposure to silica dust by selecting a combination of the following controls listed in order of preference:
• Elimination and substitution
• Engineering
• Administrative
•Personal protective equipment

**Elimination and Substitution**
We recognize the importance of planning the work in order to minimize the amount of silica dust generated. During the project planning phase, we will advocate for the use of methods that reduce the need for cutting, grinding, or drilling of concrete surfaces (e.g., formwork planning). Whenever possible, we will schedule work when concrete is wet due to reduced quantity of dust released at that time.

**Engineering Control of Dust**
Selecting an appropriate control measure depends on the specifics of the operation. In some cases, local exhaust ventilation (LEV) may be effective at controlling exposure (e.g., during grinding operations) than wetting methods. In a different application, wetting may be more effective (e.g., during cutting operations) than LEV. However, using LEV may reduce the amount of final cleaning required, as the silica dust is captured.

Dust control systems may employ three well-established techniques:
• Local exhaust ventilation (LEV)
• Wet dust suppression (WDS)
• Restricting or isolating the work activity with barriers or full enclosures (this may be the only option where LEV or WDS is not practical or effective)

**Local Exhaust Ventilation (LEV)**

When LEV is used in our work, the company will employ the following systems and safe work practices:

• Vacuum attachment systems to capture and control the dust at its source whenever possible.
• Dust control systems (used regularly and well maintained).
• Grinding wheels operated at the manufacturers' recommended rpm (operating in excess of this can generate significantly higher airborne dust levels).
• Retrofit shrouds or exhaust cowlings for corner grinding; use manufacturer-specified rpm speeds and a well-maintained HEPA vacuum.
• Diamond stone grinders, which allow for the use of a more efficient suction casing on the grinder, whenever practicable.
• HEPA or good quality, multi-stage vacuum units approved for use with silica dust. [The vacuum units should be capable of creating a target airflow of at least 70 cfm. This should achieve a face velocity at the shroud of about 1.3 m/s (260 fpm)—the higher the face velocity, the more dust captured at source.]
• Work planning, so that concrete grinding can be completed when wet (dust release can be significantly reduced).
• Good housekeeping work practices (for example, use vacuums with high-efficiency particulate air (HEPA) filters, or use wet sweeping).
• Train employees and supervisors on how to properly use and maintain the equipment.

**Wet methods for Dust Control**

When water spray systems are used in our work, we will follow these safe work practices:

• Pneumatic grinders will be used instead of electric-powered grinders if water is the method of control.
• Pressure and flow rate of water will be controlled in accordance with tool manufacturers' specifications (for cutting saws, a minimum of 0.5 liters of water per minute should be used).
• When sawing concrete or masonry, we will use only saws that provide water to the blade. Wet slurry will be cleaned from work surfaces when the work is completed, using a wet vacuum or wet sweeping.

**Barriers and Enclosures**

When barriers or enclosures are used in our work, we will follow these safe work practices:

• The site foreman will determine the type and design of barrier or enclosure (based on the work activity and the work area) and ensure it is constructed in accordance with the work plan. Barriers may be simple hazard-flagging ribbon or more restrictive hoarding.

• The company will use commercially available negative air units when constructing a full enclosure.

**Administrative Controls**

The company will follow these safe work practices:

• Exposure control plans and the site risk assessment/work plan will be submitted to the general contractor prior to the start of work.

• We will establish procedures for housekeeping, restricting work areas, personal hygiene, worker training, and supervision.

• As part of our project planning, we will assess when silica dust may be generated and plan ahead to eliminate or control the dust at the source. We recognize that awareness and planning are key factors in the prevention of silicosis.

• Warning signs will be posted to warn workers about the hazards of silica and to specify any protective equipment required (for example, respirators).

• Work schedules will be posted at the boundaries of work areas contaminated with silica dust.

• Work that generates silica dust may be conducted at differing hours from normal project schedule, when access to other unprotected workers cannot be restricted.

• We will develop a site-specific exposure control plan to cover project-specific issues (e.g., scope of work, project location and site-specific hazards) and to be kept available at the worksite.

**Personal Protective Equipment**

Respiratory protection

• Respirators must be selected based upon measured exposure levels and the assigned protection factor of respirators.

• Only approved respirators will be used.

• Employees are to be properly trained in the use of respirators, and a high standard of supervision, inspection, and maintenance will be followed.

**Education and Training**

An employee who may be exposed to silica is to be informed of the health hazards associated with exposure to that substance, is informed of measurements made of airborne concentrations of harmful substances at the work site, and is trained in procedures developed by the company to minimize the employee's exposure.

Training is required prior to using silica-containing materials or working in an environment known to contain airborne concentrations of silica. Periodic refresher training may also required. Silica dust training may include the following:

• Hazards associated with exposure to silica dust
• The risks of exposure to silica
• Signs and symptoms of silica disease
• Safe work procedures to be followed
• Use of respirators and other personal protective equipment
• Use of control systems
• How to seek first aid (for example, the location and use of eyewash stations)