Crystaline Silica

Exposure Control Policy ,

Program & Procedure

Tri-Messine Construction Co., Inc.

Part 1

Silica Exposure Prevention & Control: Introduction

Silica is the second most common mineral on earth, found in the common form as sand. Silica is the compound formed from the elements silicon (Si) and oxygen (O) its molecular form is SiO2. The three main forms of 'polymorphs' of silica are alpha quarts, cristobalite and tridymite. The polymer most abundant and most hazardous to human health is alpha quartz; it is commonly referred to as crystalline silica.

Health hazards Associated with silica Exposure

If crystalline silica becomes airborne through industrial activities, exposure to fine crystalline silica dust (specifically exposure to the size fraction that is considered to be respirable) can lead to 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 the symptoms of the disease may not appear

for many years. As noted in the following figure (respirable) silica dust is very small, and is not visible to the human eye.

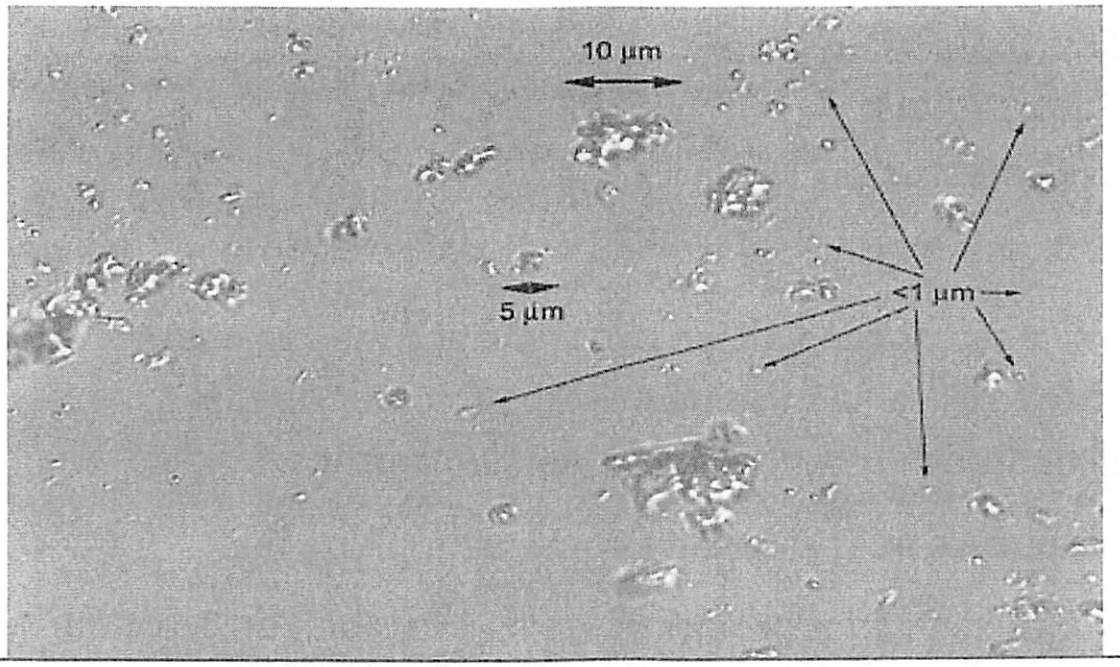

Figure 1: Crystalline silica up close, 1000 times magnification of sand dust. These particles are small enough to trapped in lung tissue

A worker may develop any of three types of silicosis, depending on the concentration of silica dust and the duration of the exposure.

- Chronic silicosis: Develops after 10 or more years of exposure to crystalline silica and relatively low concentrations.
- Accelerated silicosis: develops 5 to 10 years after initial exposure to crystalline silica high at concentrations.
- Acute silicosis: develops within weeks, or 4 to 5 years after exposure to very high concentration of crystalline silica.

Initially, workers with silicosis may have no symptoms; however, as the disease progresses workers 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.

Silica exposure at Tri-Messine Construction Co., Inc.

Many of the activities performed at Tri-Messine Construction Co., Inc. projects result in the creation/release of silica dust, exposing our employees. These activities include, but are not necessarily limited to:

- Drilling (of concrete)
- Sweeping/Brushing
- Chipping
- Saw cutting

Part 2

Silica exposure Prevention & Control: Statement of Purpose

Tri-Messine Construction Co., Inc. recognizes the right of workers to work in a safe and healthy work environment. We are committed to ensuring that every reasonable precaution is taken to protect our employees and others from the adverse health effects associated with exposure to silica.

Part 3

Silica exposure Prevention & Control: Responsibilities

Due to the risk posed by respirable silica, is critical that all personnel involved in activities that could potentially create silica dust take specific actions to ensure that, as much as practicable, a hazard is

not created. In recognition of this, the following (silica related) responsibilities have been established and must be adhered to:

Tri-Messine Construction Co., Inc. Management is responsible for:

- Regularly evaluating new equipment and technologies that become available, as able/appropriate, purchasing the most adequate equipment/technologies (within Tri-Messine Construction Co., Inc. capabilities). Equipment/technologies with (silica) dust suppression and/or capture technologies will generally be given preference over equipment/technologies that lack such.

- Ensuring project and/or task specific Exposure Control Plans (ECPs) are developed communicated and effectively implemented as appropriate.

- Ensuring that all employees receive the necessary education and training related to this program, as well as project/task specific ECPs. Copies of ECP will be available to all employees.

- Conducting a review of this program at least annually, as well as project task, specific ECPs, available exposure monitoring data if applicable.

Tri-Messine Construction Co., Inc. Supervisors, Superintendents and foreman's are responsible for:

- Obtaining a copy of the project/task specific ECPs and ensuring such are made available at each work site.

- Ensuring that all the tools, equipment, PPE and materials (including water) necessary to implement the ECP is available and in good working order prior to allowing work activities to commence.

- Ensuring that all workers under the supervisor's direction and control have received the necessary education and training. As appropriate, each supervisor must ensure that workers are available to demonstrate competency for identified task.

- Ensuring that workers adhere to the project/task specific ECP, including PPE requirements.

- Coordinating work activities with the Owner/Prime Contractors as required, and/or otherwise, implementing the controls necessary

to protect others who could be adversely affected by these work activities.

Tri-Messine Construction Co., Inc. Employees and subcontracted employees are responsible for:

- Knowing the hazards of silica dust exposure.
- Using the assigned personal protective equipment in an effective and safe manner.
- Working in accordance with the project/task specific ECP.
- Reporting immediately to their supervisor, any hazards (unsafe conditions, unsafe acts by others, RWLB violations, improper operation of equipment, etc.)

Part 4

Silica exposure Prevention & Control: Exposure limits

Exposure Limits/Considerations:

The Occupational Health & Safe Regulations (OHSR) lists an occupational exposure limit (OEL) for respirable crystalline silica (including quartz) of 0.025 milligrams per cubic meter (mg/m^3). This is a concentration to which nearly all workers could be exposed for eight hours a day, five days a week, without adverse health effects. However, as a suspected carcinogen, crystalline is also an ALARA substance, and exposure must be reduced to the levels As Low As Reasonably Achievable below the OEL.

Part 5

Silica Exposure Prevention & Control: Risk Identification

The health hazards of silica come from breathing in the dust.

In addition to identifying the specific activities/areas where personnel could be exposed to silica dust, the amount and duration of exposure must also be considered. With consideration to these three factors, work performed by

Tri-Messine Construction Co., Inc. that exposes our employees as well members of the public and other workers (subcontractors) to the dust include, but are not necessarily limited to:

- Drilling (concrete)
- Chipping/breaking/grinding
- Sweeping
- Saw cutting

Part 6

Silica Exposure Prevention & Control: Risk Assessment

Risk Assessment

Tri-Messine Construction Co., Inc. will use a variety of methods to assist with the "assessment" of possible and actual silica exposures. These methods will include, but may not necessarily be limited to:

- Reviewing data/reports available in the public domain (information available through regulatory agencies and industry safety associations)

- Regularly consulting with safety Resources/Safety Managers from firms who perform similar work tasks.
- Implementing a suitable respirable silica exposure monitoring program. This program will ensure that over time Tri-Messine Construction Co., Inc. has quantifiable

silica exposure data available that is representative of all regularly occurring, as well as reasonably foreseeable work activities. Exposure monitoring will generally be conducted "in-house", although assistance may be obtained through outside consultants/hygienist if it is necessary.

Part 7
Silica Exposure Prevention & Control: Risk control

Control Methods

When determining measures to reduce and eliminate work exposure to silica dust, Tri-Messine Construction Co., Inc. will generally select a combination of controls, listed in order of preference:

- Elimination and substitution
- Engineering
- Administrative
- Personal Protection Equipment (PPE).

Substitution and Elimination

Whenever possible Tri-Messine Construction Co., Inc. will substitute products containing silica with products that do not contain or contain a lower percentage of Crystalline Silica. While there have historically been few substitution options available, Tri-Messine Construction Co., Inc. recognizes the

importance of planning work in order to minimize the amount of silica dust generated. During the planning phases of the project, Tri-Messine Construction Co., Inc. will advocate the use of methods that reduce the need for cutting, grinding, and drilling of concrete surfaces.

Engineering Controls

Engineering controls are dust controls which aim to control or otherwise minimize the release of crystalline silica. Two common engineering control options are available to Tri-Messine Construction Co., Inc. this includes wet dust suppression systems (WDS) and the use of ANZI approved silica dust masks not disregarding local exhaust ventilation.

Dust Control Tools and Solutions

- These tools will help reduce dust exposure and increase the productivity on site. Which give great benefits to the employers by totally reducing or eliminating the exposure to silica.
- Dust control tools and systems will be maintained in optimal working condition

WDS System

Many tools/appliances at Tri-Messine Construction Co., Inc. are equipped with WDS system. When WDS systems are not available similar effects can also be achieved by manually wetting the surface. When WDS systems are used, Tri-Messine

Construction Co., Inc. will employ the following systems and safe work practices:

- If water is not available in the specific Tri-Messine Construction Co., Inc. project, the project supervisor will have water delivered to the site for use.
- Pressure and flow rate will be controlled in accordance with tool manufactures' specifications.
- Wet slurry will be cleaned from work surfaces when work is complete, if/when necessary.

Administrative Controls

Administrative controls are those that aim to control or minimize the release of silica through the use of work procedure and work methods, rather than affecting the actual physical work. Common examples of administrative controls include, but are not limited to:

- Posting of warning signs
- Rescheduling of work as to avoid the activities of others
- Relocating unprotected workers away from dusty areas

When administrative controls are used, Tri-Messine Construction Co., Inc. employs the following system and safe work practices.

- Suitable housekeeping, restricted work area, hygiene practices, training and supervision procedures/standards

determined and implemented on Tri-Messine Construction Co., Inc.

- As appropriate, barriers will be erected around known silica dust generating activities and/or warning signs will be posted.
- As able, work activities will be scheduled to minimize the silica related effect on and from others.

Personal Protective Equipment Controls (PPEC)

When used in conjunction with the other (engineering and administrative) controls elsewhere identified, personal protective equipment and clothing can help further reduce our employees' exposure to silica dust. Air purifying dust masks with HEPA filters are a common piece of PPE that will be used by Tri-Messine Construction Co., Inc. to minimize exposure to silica dust. Depending on the effectiveness of the other engineering control measures employed, either a full face piece or a half face piece respirator will be used. When working indoors, or in other areas with poor or no ventilation these respirators will be seal dependent, the user will be fit tested and clean shaven where the respirator seals to the face.

Part 8

Silica Exposure Prevention & Control: Education and Training

Education and Training

Prior to performing activities, or working on project sites where personnel could be exposed to silica dust, Tri-Messine Construction Co., Inc. will ensure that personnel will receive suitable education and training. As necessary, personnel will be trained to a level of demonstrative competency. Education and training will include:

- The hazard and risk associated with exposure to silica dust.
- The signs and symptoms of silica related diseases.
- General and specific silica exposure reduction methods/strategies.
- The use of specific pieces of equipment and control systems.
- The use and care of respiratory and other PPE.
- How to seek first aid and how to report items of concern.

The education and training detailed will be delivered to Tri-Messine Construction Co., Inc. employees through a variety of forums, including but not necessarily limited to:

- New employee Orientation
- Project/site orientations
- Equipment/task specific training
- Start of shift tool box talks

Part 9

Silica Exposure Prevention & Control: Safe Work Procedures

Tri-Messine Construction Co., Inc. will ensure that suitable procedures for controlling the risk of silica exposure are developed. This document/table summarizes the silica control options generally available on Tri-Messine Construction Co., Inc. sites/projects and will complimented with project/task specific exposure control plans as necessary. This document and any supplemental work procedures will be made readily available for review by all affected workers.

Task	Control Methods	Personal Protection Equipment	Comments	Required Respiratory Protection/Minimum Assigned Protection Factor (APF) on 8 hr. TWA
Saw Cutting (Drilling/Chipping) Jack Hammering	WDS System	• Safety Glasses • Face Shields • Gloves • Silica Dust Mask	• Be aware of surroundings • Check air hose for cuts bare wire • Use eye protection at <u>ALL</u> times.	<4 hr. >4hr. None None

Task	Control Methods	Personal Protection Equipment	Comments	Required Respiratory Protection/Minimum Assigned Protection Factor (APF) on 8 hr. TWA
Sweeping/ Brushing	• Sweeping Compound • Broom • Hand Held Sprayer	• Safety Glasses • Gloves	• Check working area for possible tripping hazards • Be aware of surrounding trades in the working area keep those to as minimum as possible with the use of WDS	<4 hr. >4hr. None None

Part 9
Silica Exposure Prevention & Control:

Tri-Messine Construction Co., Inc. will Offer **medical exams** every year for workers who are required by the standard to wear a respirator for 30 or more days per year.

Records of all medical exams will be kept on file at Tri-Messine Const. Co. main office located at 6851 Jericho Turnpike Suite 240, Syosset, NY 11791