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# Recommended Skills and Capabilities for Silica Competent Persons

White Paper

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Sponsored by the AIHA® Construction Committee, Silica Competent Person Subgroup  
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## **EXECUTIVE SUMMARY**

The United States Occupational Safety and Health Administration (US OSHA) in their Silica Standard for Construction (29 CFR 1926.1153) states that the employer must identify a competent person to ensure implementation of the required silica written exposure control plan. While the competent person is critical to the effective implementation of a silica program, what actually constitutes a competent person in this area is not well defined.

This document provides a list of recommended subject-specific skills and competency objectives a silica competent person should have to enable them to perform the job successfully. This is for guidance purposes only, and does not constitute a training program. It could be used as an outline for what to include in a silica training program. It represents a body of knowledge that may be useful to assist a competent person in providing meaningful worker protection from silica. However, it is ultimately the employer's responsibility to identify and provide any training that the competent person needs for their particular worksites.

## **THE IMPORTANCE OF COMPETENT PERSONS IN CONSTRUCTION**

A key component in preventing overexposure to silica and subsequent disease is having at least one individual, the competent person, who is capable of recognizing and evaluating situations where overexposure may be occurring: someone who knows how to evaluate the exposure potential and who can make an initial recommendation on how to control that exposure. The competent person is not required to be onsite at all times but must have the ability to make frequent and regular inspections of jobsites, materials, and equipment to effectively implement the written exposure control plan.

The hazards of excessive exposure to crystalline silica have been known since ancient times. However, data from the National Occupational Respiratory Mortality System indicates that between 1990 and 1999 there were 118 reported silica-related deaths in the construction industry. As with all occupational illnesses, underreporting occurs, and the true number of cases would be expected to be higher.

The construction industry is dominated by small- and medium-sized employers. Over 80% of construction businesses have 10 or fewer employees, according to *The Construction Chart Book* published by CPWR – the Center for Construction Research and Training). Many small- and medium-sized employers have neither safety nor industrial hygiene staff.

An approach used by OSHA and the American National Standards Institute for construction regulations and guidance is to specify that an employer designate a “competent person” for hazards involving medium to high complexity. For example, competent persons are required by construction standards for scaffolding, trenching, asbestos, and lead.

According to 29 CFR 1926.32(f), a competent person shall be one who is “capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.”



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The use of competent persons is well recognized and accepted in the construction industry and serves as a mechanism to encourage that a minimal level of safety and health capability and competency be available, even for small jobs and small employers. The competent person recognizes the problem, has the authority to initiate basic corrective action, and has the knowledge and ability necessary to fulfill his or her responsibilities to implement the written exposure control plan. It is important to note that skill levels for competent persons for occupational health are much more basic than those of industrial hygienists. OSHA regulations commonly use the term *qualified person* to differentiate a safety and health professional from a competent person.

## LIMITATIONS OF THE COMPETENT PERSON APPROACH

OSHA regulations that incorporate competent persons vary in the detail provided on the skills and capabilities needed by competent persons to be able to successfully identify and address hazards. Some regulations, such as the asbestos regulations in construction standards, provide specific training requirements, whereas other regulations such as excavation trenching are vague about training or skills needed by competent persons.

Lack of specificity potentially undercuts the value of the competent person concept. It leads to variation in the training developed by various safety and health professionals and training providers.

Providing a list of recommended subject-specific skills and competency objectives is one way to remedy this limitation. That is the purpose of this white paper, which can be used as a list of training objectives (or evaluation objectives for those who have received prior training). This tool helps ensure more consistent training and more consistent protection of construction workers. It represents a common minimum body of knowledge needed by competent persons to provide meaningful worker protection from silica.

## SILICA COMPETENT PERSON

OSHA's Advisory Committee for Construction Safety and Health recommended that OSHA utilize a competent person approach for silica, as indicated in construction rule 29 CFR 1926.1153. OSHA has developed Table 1 in 29 CFR 1926.1153 for 18 specific tasks and provided employers with an option of following task-specific precautions that include the use of specific controls and personal protective equipment (PPE) in lieu of exposure assessment.

While this approach does provide flexibility for employers, such an approach could put exposed employees at risk if controls are not correctly used or maintained — hence the need for a trained, competent person. In addition, the National Occupational Research Agenda construction goals for silica identified competent person training needs as an area for partnering and development.

Competent-person training provisions can add to confidence that controls are being used effectively and that someone on the jobsite knows when to seek assistance with responding to more complex or unusual scenarios. These services can be provided by equipment and tool manufacturers or an individual with sound knowledge of the OSHA silica standard.



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## COMPETENCY OBJECTIVES

The following are 10 objectives to be demonstrated for successful completion of a silica competent person training program.

### Introduction to “Competent Person”

A silica competent person:

- Can describe the role of the silica competent person on a jobsite
- Can list construction tasks specific to their operations (and those of other contractors that can potentially affect their workers) that may require review by a silica competent person
- Understands the knowledge, skills, abilities and authority needed by a silica competent person
- Understands the role of a qualified person and the relationship between a competent person and qualified person
- Knows the applicable regulatory requirements that apply for a silica competent person
- Understands what will be needed for successful completion of this training program
- Knows how to implement the employer’s written silica protection program
- Knows how to fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on OSHA’s Table 1 in 1926.1153
- Knows how to implement alternative control methods for tasks not listed in Table 1, or where the employer does not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1
- Understand the hierarchy of controls (HOC) and how to apply it to protect workers

### Introduction to Silica

A silica competent person:

- Can describe what crystalline silica is and where it comes from
- Can list silica-containing materials typically found on construction sites
- Can identify workplace tasks specific to their operations (and other contractors whose work may affect their workers) where silica exposure may occur

### Silica Hazards and Exposures

A silica competent person:

- Can describe the routes of exposure significant for silica
- Can describe the health effects of silica overexposures
  - signs and symptoms of exposure
  - diseases associated with silica



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- Understands what an occupational exposure level (OEL) is and how exposures are measured by qualified persons
- Understands the exposure levels and tasks associated with acute and chronic silicosis
- Can describe the obstacles to worker recognition of silica illnesses (e.g. particles too small to be seen, no immediate cause and effect connection)
- Familiar with current regulatory and good practice requirements
  - silica regulatory OEL (e.g., OSHA permissible exposure limit, or PEL)
  - silica good practice OEL (e.g., ACGIH TLV)
  - non-silica specific regulatory requirements
    - ♦ hazard communication (29 CFR 1926.59)
    - ♦ sanitation (29 CFR 1926.51)
    - ♦ respiratory protection (29 CFR 1910.134)

### **Determining if Silica is Present**

A silica competent person:

- Can describe the three major options for making a determination if silica is present
  - bulk sample analysis of work materials
  - use of safety data sheets (SDS) for construction products brought on site
  - presumption of silica content based on material checklists

### **Potential Worker Exposure Levels for Common Construction Tasks without Controls**

A silica competent person:

- Is knowledgeable about published exposure level ranges for common construction tasks specific to their operations.
  - abrasive blasting dry
  - tuckpointing
  - masonry cutting or surface grinding
  - concrete mixing
  - chipping gun/jackhammer
  - walk-behind saw
  - backhoe/excavator
  - concrete/mortar mixing



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- Understands and can identify situations that could result in higher exposures
  - enclosed areas
  - improper work practices
  - multiple workers in the same area performing silica-generating tasks
  - high silica content
  - high-power tools
  - maintenance failures
  - extended shift work
- Understands and can identify situations when a qualified person should be called in for further evaluation

### **Controls Used to Reduce Silica Exposures**

#### **Engineering Controls**

A silica competent person:

- Understands the two major engineering controls for reducing silica exposure levels
  - local exhaust ventilation (LEV)
  - wet methods
- Understands the critical features for controls to be effective (e.g., portable local exhaust: duct size, cubic feet per minute (CFM) rate of exhaust, duct velocity; wet methods: water flow rate, point of application)
  - pros, cons, and limitations for each control
  - waste disposal issues
  - importance of maintenance
- vacuum flow rates
- safe emptying of vacuum
- filter replacement
- water flow rates
- wastewater

#### **Respiratory Protection**

Note: Training to be a qualified respirator program administrator is out of scope for this training.

- Basic understanding of respiratory protection, including
  - how respirators work
  - types of respirators: negative pressure, powered air-purifying respirator, supplied air



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- types of respirators used for construction tasks as it relates to silica exposure
- pros, cons, and limitations of each type
- assigned protection factor
- general recommendations based on tasks
- training and medical requirements
- Is knowledgeable about reduced exposure levels when controls are used for common construction tasks and use of OSHA Table 1 specific to their operations for example:
  - abrasive blasting wet
  - tuckpointing with LEV
  - masonry cutting with wet methods

### **Oversight and Quality Assurance**

A silica competent person:

- Understands the need for regular (at least annual) review of the written exposure control plan, exposure monitoring and their updating as needed. Is familiar with US OSHA documents (e.g. most current FAQ documents for the construction industry) that give further advisory and informational content on the requirements for the review.
- On multi-employer worksites, use proper communication methods to notify other employers who may be affected by silica-generating tasks

### **Review of OSHA's Silica Standard**

A silica competent person needs both to have a detailed knowledge of the current regulation 29 CFR 1926.1153 and to be aware of the differences between it and the general industry version 29 CFR 1910.1053.

In addition, a silica competent person should also be familiar with OSHA published documents regarding silica (e.g., Small Entity Compliance Guide for Construction, Frequently Asked Questions, March 2016 and December 2018).

### **Authority: Responsibilities and Procedures**

A silica competent person:

- Understands their responsibility and has the authority to take prompt correction measures as necessary to control hazards
- Understands the role of specific project or company procedures for resolving common jobsite safety and health situations
- Understands and ensures engineering, work practice, and respiratory protection controls are implemented per the company's written exposure control plan



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- Can describe key corrective actions needed for situations such as breakdown of engineering control equipment or improper use of PPE
- Understands communication roles involving employers, employees, emergencies, documentation of actions, sharing of exposure monitoring results, and regulatory communication and recordkeeping
- Understands communication roles involving potentially exposed employees of other subcontractors or contractors on site who are not involved in the silica-generating activity.

### **Putting It All Together: Mock Job Examples**

The silica competent person should be able to:

- Demonstrate that he/she understands the information and can identify actions needed for several mock job examples, from the pre-job planning stage through determination of presence of silica and potential exposure, construction and oversight steps.
- Demonstrate that he/she understands his/her responsibility and authority, and can properly implement corrective actions needed for a mock job example.
- List the specific procedural, communications, and documentation protocols to be followed for the situations found in the case-study outlines.

### **Overexposures Abatement Procedures and Protocols**

What action should be taken when an overexposure situation is determined for:

- Employees of the competent person's employer
- Employees of the competent person's employer's subcontractors
- Employees of other contractors
- The public

### **Lack of Proper Evaluation of Exposures**

What action is to be taken when potential exposures are noted that have not been properly evaluated for:

- Employees of the competent person's employer
- Employees of the competent person's employer's subcontractors
- Employees of other contractors
- The public



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## DEFINITIONS

**Amorphous silica:** Includes noncrystalline forms of silicon dioxide (SiO<sub>2</sub>) — diatomaceous earth, silica gel, diatomite.

**Crystalline silica:** The crystalline form of silicon dioxide (SiO<sub>2</sub>) — e.g. quartz, cristobalite, tridymite, and Tripoli.

**Occupational exposure limit (OEL):** Health and feasibility-based workplace standards to protect workers from adverse exposure (e.g., OSHA PEL, ACGIH TLV, NIOSH REL, AIHA WEEL, DFG MAK).

**Respirator program:** Occupational use of respirators must be in compliance with applicable health and safety standards such as 29 CFR 1910.134 in the United States, CSA Z94.4 in Canada, and/or requirements of the applicable jurisdiction as appropriate. Use must also comply with any applicable substance-specific regulations that may be in force.

**Silica:** In this document, *silica* refers to crystalline silica unless otherwise noted. A silica competent person is typically on site on a daily basis, with this position being an additional duty (e.g., superintendent, lead foreman, on-site safety representative). A second option is a roving competent person responsible for several close proximity job sites and who can make “frequent and regular” inspections of the worksite.

**Silica Competent Person per 29 CFR 1926.1153(f):** Competent person means 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. The competent person must have the knowledge and ability necessary to fulfill the responsibilities set forth in paragraph (g) of this section.

**Silica qualified person:** The silica qualified person:

- Has a recognized degree, certificate, or professional standing in an occupational health, safety, environmental, or engineering field (e.g., CIH, CSP, PE)
- Has extensive knowledge, training, and experience in hazards and control of silica hazards on the construction site through formal training and/or extensive, firsthand experience in anticipation, recognition, evaluation, and control of worker silica exposure
- Can make quantitative assessments of worker exposure and recommend detailed control measures

The qualified person is typically not on site on a daily basis. The person may be the corporate or regional safety and health director or manager or outside consultant.



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## Appendix A: OSHA's PERMISSIBLE EXPOSURE LIMIT AND EXPOSURE MONITORING

A silica competent person is expected to perform air sampling only under the direct supervision of an industrial hygienist (qualified person). However, the competent person should understand how air sampling results are obtained and interpreted.

The sampling methodology for crystalline silica differs from many other particulates found in construction. Silica sampling is size selective for respirable particulate only. These are smaller size particles that can be inhaled into the lungs. This requires a particle size selection device and a specific sampling airflow rate.

For most silica sample collection devices, airflow rate is critical for accurate sample collection. Regular observation of worker activity and the sampling device throughout the day is vital for proper interpretation of the results. For these reasons, exposure monitoring is best left to a qualified person.

Possible qualified air sampling personnel include, but not limited to:

- workers' compensation insurance company loss control representatives
- private consultants – while not required, it is suggested the consultant be a certified industrial hygienist (CIH) or be directly supervised by a CIH
- federal or state plan OSHA consultation

## Appendix B: ADDITIONAL STATE AND JOB SPECIFIC SILICA REGULATIONS

Contractors and competent persons should be aware of state plan OSHA silica regulations and contractual obligations that may place additional requirements beyond those in 29 CFR 1926.1153. Employers should review contracts carefully to determine if there are any additional requirements regarding silica.

The following list of state plan silica regulations is not comprehensive. Contractors are strongly encouraged to contact state agencies where they work that have occupational health regulatory authority to determine if there are additional regulations they must comply with.

- California: Title 8 CCR 1530.1 – Control of Employee Exposures from Dust-Generating Operations Conducted on Concrete or Masonry Materials.
- New Jersey – Administrative Code Title 34 34:5-182 Dry cutting, grinding of masonry, certain circumstances; prohibited



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## RESOURCES

ASTM. Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica (ASTM E1132). [www.astm.org](http://www.astm.org).

American Society of Safety Professionals. Silica Resource Guide for Contractors. (September 2018). [www.assp.org/docs/default-source/Practice-specialties/assp\\_silica\\_resource\\_guide\\_0918.pdf?sfvrsn=4](http://www.assp.org/docs/default-source/Practice-specialties/assp_silica_resource_guide_0918.pdf?sfvrsn=4).

Center for Construction Research and Training. Work Safely With Silica. [www.silica-safe.org/](http://www.silica-safe.org/).

Construction Safety Council. Training courses on silica and other construction site safety and health hazards. [www.buildsafe.org](http://www.buildsafe.org).

Laborers' Health & Safety Fund of North America. Silica. [www.lhsfna.org/index.cfm/occupational-safety-and-health/silica/](http://www.lhsfna.org/index.cfm/occupational-safety-and-health/silica/).

NIOSH. Respirator User Notices Subject: All Users of Type CE, Abrasive-blast Supplied-air Respirators. (1996). [www.cdc.gov/niosh/npptl/usernotices/notices/run-052396a.html](http://www.cdc.gov/niosh/npptl/usernotices/notices/run-052396a.html).

NIOSH. Health Effects of Occupational Exposure to Respirable Silica. DHHS (NIOSH) Pub. no. 2002-129. (2002).

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NIOSH. NIOSH Pocket Guide to Chemical Hazards. DHHS (NIOSH) Pub. no. 2005-149. (2007).

NIOSH. NIOSH Manual of Analytical Methods, 5th ed. DHHS (NIOSH) Pub. no. 94-113. (2017).

OSHA. Controlling Silica Exposure in Construction. Pub. no. OSHA 3362-04. (2009).

OSHA. Safety and Health Topics – Crystalline Silica. [www.osha.gov/dsg/topics/silicacrystalline/](http://www.osha.gov/dsg/topics/silicacrystalline/).

University of Washington. Silica on Construction Work Sites. <http://depts.washington.edu/silica>.



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