

**DIVISION OF OCCUPATIONAL SAFETY AND HEALTH  
POLICY AND PROCEDURES MANUAL**

# **Crystalline Silica Inspection Guidelines**

## **With emphasis on exposure to concrete and masonry dust in construction per 8 CCR section 1530.1**

P&P C-51

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**AUTHORITY:** California Labor Code Sections 6300 et seq and Title 8, California Code of Regulations (CCR) Sections 1513, 1530, 1530.1, 1538, 5141, 5143, 5144, 5155, and 5194

**POLICY:** It is the policy of the Division of Occupational Safety and Health to implement an emphasis program and uniformly conduct inspections to identify and reduce or eliminate the health hazards associated with occupational exposure to crystalline silica.

### **Purpose**

The purpose of this document is to implement in California procedures for DOSH personnel to focus attention on potentially hazardous exposures to crystalline silica in the course of enforcement activities. Particular emphasis will be given to enforcement of the standard for control of dust exposures from work on concrete and masonry materials in construction (Title 8, [section 1530.1](#)).

The procedures below are intended to serve as the California response to and incorporation of the Federal OSHA National Emphasis Program for Crystalline Silica detailed in CPL 03-00-007 [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=DIRECTIVES&p\\_id=3790](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=3790)

As noted in the OSHA CPL (pg A-4) excessive exposure to crystalline silica is recognized to be the cause of pulmonary silicosis. In addition, there is evidence that it may be associated with the following serious diseases: lung cancer, tuberculosis, chronic obstructive pulmonary disease (COPD), immunologic disorders, renal disease, and stomach and other cancers. Because of the seriousness of these conditions, and the potential for excessive exposures in a wide range of industries, it is important that workplace operations which can cause exposure be recognized and evaluated by the Division in the course of enforcement inspections, and appropriate

steps taken to develop evidence to sustain citations for violative conditions observed and obtain abatement of violations and hazardous levels of exposure.

### **Inspection Procedures for the Title 8 1530.1 Emphasis Program**

The particular operations within these industries which would generally be subject to the provisions of section 1530.1 for use of dust control systems, and which are the focus of this emphasis program include:

- Cutting and grinding of concrete and masonry materials, including interior and exterior ceramic wall and floor tile and asphaltic concrete (“asphalt”)
- Abrasive blasting of concrete and masonry materials
- Jack-hammering on concrete and masonry materials except as noted below
- Tuck pointing of masonry and caulk removal from stone-like building systems
- Drywall sanding with powered equipment
- Demolition of concrete structures or components involving cutting with powered equipment
- Dust generating operations on roofing tile and similar cementitious roofing materials are covered by all requirement of section 1530.1 only when not conducted on roof surfaces. For rooftop operations, only the training elements of section 1530.1 apply. (See Inspection of roofing operations below for additional important information.)

Note: as specified in section 1530.1, the following operations are exempted and should be covered under the other part of the SEP:

1. Stucco, plastering material, or other similar products.
2. Wall cladding, siding, or other similar products.
3. Downward drilling.
4. Jack-hammering or chipping when that work is incidental to the scope of work or planned operations of a plumbing or landscaping activity.
5. Work with powder-actuated tools.
6. Work incidental to the installation of concrete and masonry materials such as the drilling of holes for plumbing fixtures.
7. Tile backer board when cut with powered shears or a dust reduction blade having a dust containment device.

Also, dust reduction systems are not required by section 1530.1 for the following:

<p><b>Exception No. 1:</b></p>	<p>A dust-reduction system is not required if the operation, without considering any protection provided by personal protective equipment, does not result in employee exposure exceeding the Permissible Exposure Limits for applicable particulates listed in Section 5155 including, but not limited to, crystalline silica, as demonstrated reliably by air sampling data applicable to the specific operation being performed.</p>
<p><b>Exception No. 2:</b></p>	<p>A dust reduction system is not required for rooftop operations with roofing tile, roofing pavers, or similar materials.</p>
<p><b>Exception No. 3:</b></p>	<p>During the first 24 hours of an operation undertaken in response to an emergency, a dust reduction system is not required where it can reasonably be demonstrated or foreseen that use of a dust reduction system will materially impair the timely progress of the operation. For the purposes of this exception, "emergency" means an unexpected occurrence requiring immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Emergency" includes, but is not limited to, a fire, flood, earthquake or other soil or geologic movement, structural collapse, damage to a subsurface installation, terrorist act, or sabotage.</p>

**Section 1530.1 and Directly Related Inspection Elements**

Title 8 Section 1530.1 is a new regulation requiring, with certain stated exceptions, use of dust control systems employing water or local exhaust ventilation whenever cutting, grinding, coring or drilling is performed on concrete or masonry materials. The requirement is not limited to only those operations which have been shown to exceed an applicable particulate PEL. Rather the requirement applies to all such operations, subject to a number of specific exceptions including where the employer can show by reliable air sampling data that the operation will not result in exceedance of an applicable particulate PEL.

The emphasis program will focus on enforcing this new requirement, and directly related requirements for control of exposures to airborne contaminants through the following:

1. In the course of complaint and programmed inspections, CSHOs shall actively seek out through observation and inquiry the potential for operations covered by the new standard.
2. The CSHO will work to observe and document dust generating operations using photographs, interviews, and other applicable investigative techniques.
3. Where an operation covered by section 1530.1 is being conducted without use of a dust control system, the CSHO shall cite for a violation of the standard.
4. Where an operation covered by section 1530.1 is being conducted with a dust control system but it does not appear to be effectively controlling dust exposures, the CSHO shall, evaluate that the system is being used in accordance with manufacturer recommendations as required by section 1530.1(d)(2). If the system is clearly not being used effectively, for example air hoses for ventilation are blocked or kinked, or clearly inadequate quantities of water are being applied to the operation, then citation should be issued for violation of section 1530.1(c) for ineffective use of a dust control system.
5. Where dust controls are considered ineffective and the employer has air sampling results suggesting an operation is under the PEL, the CSHO may conduct air sampling to document the extent of exposure. While 1530.1 does not require air sampling for enforcement, CSHOs may conduct air sampling if possible in situations where the effectiveness of controls and/or employer sampling results are in dispute.
6. The CSHO shall evaluate the workplace for compliance with all of the requirements of section 1530.1 including required employee and supervisor annual training per subsection (e), and the safety and effectiveness of dust control systems that are used per subsection (d).

## **Inspection of Roofing Operations**

In section 1530.1, there is an exception to the requirement for use of dust control systems during rooftop operations, i.e. cutting, grinding, coring and drilling of concrete or masonry material actually conducted on rooftops (not just on the ground for an adjacent roofing operation). This exception was made not because it was believed there is no risk, for example, from exposure to dust from cutting of roofing tiles and similar material, but rather because of concern with safety issues from falls in use of local exhaust ventilation or water in rooftop operations.

It is important to note that rooftop operations covered by 1530.1 are still covered by the training requirements of the new standard.

CSHO's shall evaluate roofing operations for conduct of work of the type covered by section 1530.1. Where such work is conducted on the rooftop it is to be evaluated under the previously existing requirements for control of dust exposure in sections 5141, 5145, and 5155 and will generally require a showing of PEL exceedance to sustain a citation other than for section 5155(e) for failure to monitor the operation.

In roofing operations, CSHOs shall be mindful of use of dry sweeping and compressed air to clean cuttings dust off of roofs and to include these elements of the work in air sampling.

### **Inspection of Workplaces and Operations Not Covered by Section 1530.1**

When an inspection is conducted in a situation not covered by section 1530.1 but believed to have potential for significant dust exposure, Division staff shall be mindful of, and where appropriate inquire of the employer as to, work activities which could give rise to harmful exposures to crystalline silica. Control of silica exposure would be covered like other hazardous substances in sections 5141, 5144, 5145, and 5155 and will require air sampling and a showing of PEL exceedance.

Examples of specific operations that may not be covered by section 1530.1 but with potential for exposure to crystalline silica which, because of their sometime seasonal or intermittent nature, may not be immediately apparent in the course of inspection walk-throughs include:

- Construction operations other than cutting and grinding of concrete and masonry materials covered by section 1530.1
- Rock drilling and crushing
- Other than in construction, sand blasting for surface cleaning, paint removal etc.
- Abrasive blasting of silica-containing materials
- Cleaning of drums on ready-mix concrete trucks
- Agriculture (e.g. work near operating field equipment, or operating such equipment, esp. without a filtered air cab)
- Food processing (esp. root crop processing)

### **Air Sampling Procedures**

Air sampling for crystalline silica will be consistent with Chapter 1 of the DOSH Technical Manual. Collection of a bulk sample of settled dust for silica analysis will be consistent with Chapter 3 of the DOSH Technical Manual.

Title 8 section 5155 includes PELs for both total and respirable crystalline silica. It is important to collect a large enough air sample especially for respirable dust to enable determination of a result that is relevant to the PEL. When doing short term

sampling or possibly collecting minimal concentrations of silica, contact the analytical lab for advice on using total, respirable or both sampling methods for silica dust. When possible collect two samples, one for total silica and one for respirable silica, to compare with both PELs.

Generally, analysis should always be requested for both quartz and cristobalite, and for additional specific crystalline silica species where they are known or suspected to be present. Check with our contract analytical lab for current recommendations. When using cyclones for respirable samples, check with Calico staff for current recommendations on types of cyclones, calibration and leak testing methods.

### **Referral Procedures for Air Sampling**

CSHOs whose primary expertise is not industrial hygiene shall discuss with their district manager workplaces where they have identified potential for hazardous exposure to crystalline silica, based for example on first-hand observation of dusty operations involving mineral materials, or based upon information obtained from the employer, employees, or other credible sources of information. In such situations the district manager shall make appropriate assignments of staff with industrial hygiene expertise for further assessment.

### **Other Related Inspection Elements for All Industries Covered and Not Covered by Section 1530.1**

Consistent with the OSHA National Emphasis Program document, in the course of inspections related to both section 1530.1 and other silica inspections, CSHO's shall:

- Evaluate and cite appropriately for non-compliance with hazard communication requirements for concrete and masonry materials subject to disturbance.
- Evaluate and cite appropriately for housekeeping/hygiene violations such as lunch areas free of contaminants, and not using compressed air or other compressed gasses at pressures in excess of 10 pounds per square inch to clean clothes while being worn
- Evaluate and cite appropriately for failure of employees to understand their rights to access to information under section 3204, and the confidentiality of employer handling of medical records if any.

Title 8 Sections to keep in mind, including but not limited to:

- 5141, 5143, 5144, 5155, 5194 for other hazardous substances used besides the section 1530.1 dust exposure.
- 5145. Media for Allaying Dusts, Fumes, Mists, Vapors, and Gases

- 5152. Ventilation and Personal Protective Equipment Requirements for Grinding, Polishing, and Buffing Operations
- 1513 Housekeeping construction
- 1522. Body Protection.
- 1530 Construction – General Requirements of Mechanical Ventilation Systems (including handling of collected material)
- 1538 Rock Drilling Operations
- 3204 Access to Employee Exposure and Medical Records.
- 3301 Use of Compressed Air or Gases.
- 3367 Change Rooms
- 3368 Consumption of Food and Beverages.

Consideration should also be given to other possible violations related to operations inspected where applicable e.g. Noise, flying object protection, electrical safety (especially where water is used for dust reduction), machine guarding etc.

## **CSHO Protection**

CSHO's shall consider and provide for their personal safety and silica exposure minimization during air sampling and other inspection activities. CSHOs should avoid entry into areas of dusty operations when possible, and when not possible to avoid they are expected to provide for their safety and set a proper example by wearing appropriate respirators, protective clothing, and other PPE (e.g. hearing protection). CSHOs whose primary expertise is not industrial hygiene shall consult with their district manager on appropriate protective equipment and its use.

## **IMIS Coding - Forms 1 and 1B**

Form 1 - Inspection Report - Optional Information

Inspections conducted where we sample for crystalline silica, code S 06 CRYST SILICA

Form 1B - Violation Documentation - Substance Codes

If a citation is a result of sampling please enter the applicable substance code. Some examples of crys silica include:

(Note: There is a search feature (F7) on the substance code line 25 of the 1B data entry screen)

- 9010 SILICA CRYSTALLINE QUARTZ (RESPIRABLE FRACTION)
- 9015 SILICA, CRYSTALLINE CRISTOBALITE RES. DUST
- 9017 SILICA, CRYSTALLINE TRIDYMITE, RESP. DUST

- S103 SILICA (QUARTZ, NON-RESPIRABLE)/(QUARTZ, TOTAL)
- S114 SILICA, CRYSTALLINE TRIPOLI (AS QUARTZ), RESP. DUST
- S122 SILICA, AMORPHOUS, DIATOMACEOUS EARTH (>1% CRST.SIL)

## **DOSH Resources**

**Cyclone maintenance and leak testing:** Contact CALICO staff for parts, calibration, repair and assistance.

**Air sampling and analysis:** Contact analytical lab or senior health staff in your region or in the Research & Standards Health Unit.

**Engineering controls for cutting and grinding of concrete or masonry material:** Contact senior health staff in your region or in the Research & Standards Health Unit.

Also see:

- [The NIOSH publications page for silica including control measures](#) and
- The DOSH Silica Hazard Alert for Construction (document under development).

**Engineering controls for Granite countertop fabrication:** Contact senior health staff in your region or in the Research & Standards Health Unit. Also see DOSH Hazard Alert: [http://www.dir.ca.gov/dosh/dosh\\_publications/GraniteHazardAlert.pdf](http://www.dir.ca.gov/dosh/dosh_publications/GraniteHazardAlert.pdf)