Silica Hazards in General Industry

Information for Employers

What is the Problem?

Workers who fabricate countertops from artificial stone in California are often exposed to dangerous levels of respirable crystalline silica. These workers can develop silicosis, an incurable and potentially fatal lung disease.

"Artificial Stone" is any reconstituted, artificial, synthetic, composite, engineered, or manufactured stone product. It is commonly made by combining natural stone or other crystalline silica-containing materials with adhesives, polymers, epoxies, resins, or other binding materials to form a slab. NOTE: Fired ceramic and porcelain tiles and panels are **not** artificial stone.

Between January 2019 and March 2025, 294 California workers who make countertops from artificial stone developed silicosis. Fifteen (15) of these workers died, thirty one (31) received lung transplants, and twenty six (26) others are disabled, awaiting a possible lung transplant. Only about half of the people who receive a lung transplant will still be alive after five years. The number of silicosis cases continues to grow. These numbers do not include unreported and misdiagnosed cases.

Cal/OSHA inspections of the artificial stone fabrication industry from 2019 through 2024 found widespread non-compliance with Title 8 California Code of Regulations **section 5204 - Occupational Exposure to Respirable Crystalline Silica** (Section 5204). In 2024, Cal/OSHA implemented a Temporary Emergency Standard to improve protections for workers under Section 5204, and in February 2025, Cal/OSHA strengthened the standard and made it permanent. All employers in the artificial stone fabrication industry are legally required to implement the new worker protections of Section 5204.

Why is Silica Dangerous?

Silica is a natural mineral that comes in different forms. Working with artificial stone produces tiny airborne silica particles that are smaller than the diameter of a human hair. These particles are known as respirable crystalline silica. Breathing respirable crystalline silica can cause:

- Silicosis — an incurable, disabling, and potentially fatal lung disease
- Lung cancer
- Kidney and autoimmune disease

In recent years, **artificial stone** has grown in popularity, particularly in the manufacture of countertops. It is extremely hazardous for employees to inhale the dust from artificial stone because it contains about 93% crystalline silica — **more than double the content of crystalline silica in granite**.

Crystalline Silica Content of Materials

Material	Percent Crystalline Silica
Artificial Stone	93% or more
Quartzite	95%
Sandstone	60%
Granite	10 to 45%
Marble	typically less than 5%
Limestone	typically less than 5%

What Must Employers do to Protect Workers?

Employers must comply with Title 8 of the California Code of Regulations, **section 5204 - Occupational Exposure to Respirable Crystalline Silica** (Section 5204) if their employees are exposed to respirable crystalline silica on the job. This fact sheet only provides an overview. Employers must refer to Section 5204 for details on the scope, requirements, exceptions, and definitions.

Employers covered by Section 5204 must:

1. Determine if "high-exposure trigger tasks" are performed at the workplace.

- **High-exposure trigger tasks** include machining, crushing, cutting, grinding, drilling, or polishing of artificial stone that contains more than 0.1% by weight crystalline silica, or other silica-containing products, including natural stone, that contain more than 10% by weight crystalline silica.
- **High-exposure trigger tasks also include** clean up, disturbing, or handling of wastes, dusts, residues, debris, or other materials created during the above-listed tasks.

2. If employees perform high-exposure trigger tasks, do all of the following regardless of employee exposure levels:

- **Determine employee exposures:** Have a qualified person[1] measure employee exposures to respirable crystalline silica at least once every 12 months. Exposures must be below the Permissible Exposure Limit (PEL) of 50 µg/m^3 of air, measured over eight hours. However, because silica dust is so dangerous, employers must comply with all

[1] "Qualified Person" means a third party independent of the employer who, by extensive instruction, knowledge, training, and experience, has demonstrated their ability to effectively perform, and interpret the results of, representative air monitoring for occupational exposure to respirable crystalline silica.

worker protections for high-exposure trigger tasks, even if exposure measurements are under 50 µg/m^3.

- **Establish a regulated area:** A regulated area is an area demarcated from the rest of the workplace. Regulated areas are established to limit the number of employees exposed to respirable crystalline silica.
  - Ensure that only authorized persons with the correct protective equipment enter the regulated area.
  - Conduct all high-exposure trigger tasks and other work with silica exposures within regulated areas.

- **Use effective wet methods** at all times.
  - Water must cover the entire surface of the stone slab whenever a tool, piece of equipment, or machine contacts the stone. Please see further details in the description of engineering controls below.

- **Clean up dusts, debris, and residues frequently** to prevent the accumulation of dust on surfaces**.**
  - Use only wet methods or vacuums with HEPA[2] filters for all cleaning.

- **Prohibitions:**
  - Prohibit dry cleaning and sweeping, dry brushing, and use of compressed air.
  - Prohibit walking through or moving equipment through dust, debris, or residue.

- **Use required respiratory protection at all times.**
  - Ensure all employees who perform or work near high-exposure trigger tasks wear a powered air purifying respirator (PAPR) or another respirator with an assigned protection factor of 1000 or better.
  - Ensure that employees are medically cleared to use a respirator.
  - Ensure that employees are properly fitted and trained to use a respirator.
  - Provide a full-face, tight-fitting positive-pressure, supplied-air respirator to employees with confirmed or suspected silicosis.

3. For workplaces with employee exposure to respirable crystalline silica, including workplaces with high-exposure trigger tasks and those without high-exposure trigger tasks, do all of the following:

- **Use a qualified person to assess employee exposures** to ensure exposures are below the Permissible Exposure Limit (PEL) of 50 micrograms of respirable crystalline silica per cubic meter of air, measured over eight hours.
  - Notify all employees of the results of exposure assessments.

[2] "High-Efficiency Particulate Air (HEPA) Filter" means a filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter.

- **Use engineering controls and safe work practices** to maintain employee exposures below the PEL.
  - **Engineering controls** that an employer can use include:
    - Substitution. Use a material that has a low silica content, such as marble or limestone, instead of artificial stone.
    - Isolation. Use automated machines in enclosed areas separated from workers.
    - Barriers. Use physical barriers or partitions to separate cutting, grinding, or polishing areas from other parts of the workplace to prevent the spread of silica dust.
    - Wet methods (required at all times for high-exposure trigger tasks). Ensure water covers the entire surface of the stone slab where a tool, piece of equipment, or machine contacts the stone. Water that is recycled must be filtered to remove silica. Use one or a combination of the following wet methods:
      - Sheet-wetting, which forms a continuous flow of water over the surface of the work object.
      - Tools with built-in water application systems, such as saws, grinders, chippers and polishers.
      - Water-jet cutters.
      - Wet milling machines and wet stone routers.
      - Automated machines with built-in water application.
    - **Ventilation. Use** local exhaust ventilation to remove silica dust from the air at the point where the tool or equipment contacts the stone and before the dust enters the worker's breathing zone. Exhausted air must go through a HEPA filter to remove respirable crystalline silica.
  - **Safe work practices include:**
    - Training employees to perform tasks and use tools, water systems, and ventilation in a way that prevents dust exposures.
    - Scheduling work so that high-exposure tasks are performed when fewer or no other employees are in the regulated area.
    - Cleaning work areas frequently using wet methods or HEPA-filtered vacuums to prevent re-suspension of silica dust.
    - Ensuring that employees do not take breaks, eat, or drink in regulated areas or other areas where silica dust could be present.
    - Ensuring that employees frequently clean their clothes and protective equipment to remove dust, including before breaks, drinking, or eating.
    - Ensuring that employees clean their clothes and protective equipment with a HEPA vacuum or wet methods.

- Prohibiting the use of compressed air or dry brushing for any purpose.
- Ensuring that employees remove protective equipment and wash their hands and face before breaks, drinking, eating, or leaving the workplace.

- **Post the following signs** at all entrances to regulated areas:

DANGER
RESPIRABLE CRYSTALLINE SILICA
CAUSES PERMANENT LUNG DAMAGE THAT MAY LEAD TO DEATH
MAY CAUSE CANCER
WEAR RESPIRATORY PROTECTION IN THIS AREA
AUTHORIZED PERSONNEL ONLY

PELIGRO
SÍLICE CRISTALINA RESPIRABLE
PROVOCA DAÑO PERMANENTE A LOS PULMONES QUE PODRÍA CAUSAR LA MUERTE
PUEDE PROVOCAR CÁNCER
USAR PROTECCIÓN RESPIRATORIA EN ESTA ÁREA
SOLO PERSONAL AUTORIZADO

- **Provide employees with information and training**.
  - Teach employees that silicosis is an incurable, disabling disease that can lead to an early death. In most cases, it does not cause noticeable symptoms at first. In advanced stages, it can cause coughing, shortness of breath, fatigue, and chest pain.
  - Teach employees about engineering controls and safe work practices to prevent dust exposures.
  - Provide training in a language the employees understand.
  - Encourage employees to report problems with dust controls and any symptoms that may be related to silica dust exposures.

- **Provide medical exams with specific tests** to employees exposed to respirable crystalline silica.
  - Make the initial medical exam available to employees within 30 days of assignment.

- Make periodic medical exams available every three years, or more frequently if recommended by the Physician or Other Licensed Health Care Professional (PLHCP)[3].
- Ensure that PLHCPs provide the required information to the employer and employee.
- Ensure that the PLHCP reports required information to Cal/OSHA and the California Department of Public Health.

- **Provide Medical Removal Benefits**
  - Remove an employee from silica exposure when recommended by the PLHCP, and maintain the employee's earnings, seniority, and benefits for up to six months, with certain exceptions.

- **Report silicosis and lung cancer** cases within 24 hours to Cal/OSHA and the California Department of Public Health.

- **Establish a written exposure control plan**. The plan must include the following:
  - A description of the tasks in the workplace with exposure to silica.
  - A description of the engineering controls, work practices, and respiratory protection used to prevent silica exposures.
  - A description of the housekeeping measures used to prevent exposure to silica.
  - The results of exposure air monitoring conducted by a qualified person, demonstrating whether engineering controls are effective at continuously maintaining exposure levels below the action level[4].
  - Written procedures for the proper use of personal protective equipment, including work clothing and respirators, that prevent exposures to silica and prevent take-home exposures.
  - Documentation that the employer has reported the use of crystalline silica to Cal/OSHA, as required by Title 8 California Code of Regulations section 5203.
  - Procedures to ensure that employees are properly trained to prevent silica exposure.
  - The Procedures used to provide medical surveillance and medical removal.

- **Maintain records.**

  - Develop and maintain an accurate record of all exposure measurements taken to assess employee exposure to silica.

  - Subsection (n) of Section 5204 requires employers to document specific types of information in the exposure record.

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[3] "Physician or Other Licensed Health Care Professional (PLHCP)" means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows them to independently provide or be delegated the responsibility to provide some or all of the particular health care services.

[4] The action level is 25 micrograms of respirable crystalline silica per cubic of air, which is half of the PEL.

Additional Resources

All Title 8 regulations that may apply to these and other hazards in your workplace can be found at **www.dir.ca.gov/ samples/search/query.htm**.

Some of the resources below reference federal OSHA regulations. Be sure to refer to the equivalent Cal/OSHA regulations that are applicable in California.

Cal/OSHA

Section 5204: Occupational Exposures to Respirable Crystalline Silica (General Industry)

Section 1530.1: Control of Employee Exposures from Dust-Generating Operations Conducted on Concrete or Masonry Materials (Construction).

Section 1532.3: Occupational Exposures to Respirable Crystalline Silica (Construction)

Title 8 sections 1530.1 and 1532.3 apply to construction-related operations, such as final trimming during installation of an artificial stone countertop at a construction site.

Respiratory Protection in the Workplace — a Guide for Employers

Guide to the California Hazard Communication Regulations

Guide to Developing Your Workplace Injury & Illness Prevention Program

Injury & Illness Prevention Model Program for High Hazard Employers

California Department of Public Health

Silica Safety Resources for Stone Fabricators

The Center for Construction Research and Training

Work Safely with Silica

Georgia Institute of Technology

Control of Silica Exposure in Engineered Stone Fabrication Facilities

Natural Stone Institute

Silicosis: An Industry Guide for Awareness and Prevention

National Institute for Occupational Safety and Health, of the U.S. Centers for Disease Control and Prevention

NIOSH Workplace Safety and Health Topics

Federal OSHA

Crystalline Silica

Stop Silicosis Forever

Ventilation

Employers who have questions or need assistance with workplace health and safety programs can call Cal/OSHA's Consultation Services Branch at 800-963-9424.

Workers in California are protected regardless of immigration status. Workers who have questions about safety and health in the workplace can call 833-579-0927 to speak with a live bilingual Cal/OSHA representative between the hours of 9:00 a.m. and 7:00 p.m. Monday through Friday.

Workers can file complaints about workplace safety and health hazards with a Cal/OSHA district office (see https://www.dir.ca.gov/dosh/districtoffices.htm).