California Department of Industrial Relations
Division of Occupational Safety & Health
Publications Unit
SAFETY & HEALTH | FACT SHEET

Silica Emergency Temporary Standard:
Information for Employers

What is the concern?

California is experiencing a silicosis epidemic among artificial stone fabrication workers.

> **"Artificial Stone"** is any reconstituted, artificial, synthetic, composite, engineered, or manufactured stone, porcelain, or quartz. It is commonly made by binding crushed or pulverized stone with adhesives, polymers, epoxies, resins, or other binding materials to form a slab.

Between 2010 and October of 2023, more than 90 California workers who make countertops from artificial stone have developed silicosis. Ten of these workers — and counting — have died. This is not counting unreported cases.

Silica is a natural mineral that comes in different forms. The crystalline forms are far more hazardous, especially when employees are exposed to airborne particle sizes smaller than the diameter of a human hair. This is known as "respirable" dust. Breathing too much airborne respirable crystalline silica (RCS) can cause:

- Lung cancer.
- Silicosis — an incurable lung disease — and other lung effects.
- Kidney and autoimmune disease.

In recent years, **artificial stone** has become more widely used, particularly in the manufacture of countertops. It is more hazardous to employees exposed to airborne dust since it can contain approximately 93% or greater crystalline silica — **more than double that for granite**.

Material	Percent Crystalline Silica
Artificial Stone	more than 93%
Quartzite	95%
Sandstone	60%
Granite	10 to 45%

High-exposure trigger tasks are of particular concern. These are tasks such as cutting, grinding, drilling, and polishing **artificial stone that contains more than 0.1% crystalline silica, or for natural stone that contains more than 10% crystalline silica**. This includes cleanup and handling of dust and debris created during these types of tasks.

Cal/OSHA inspections of the artificial stone fabrication industry in 2019-2020 found widespread non-compliance with Title 8, California Code of Regulations, **section 5204, Occupational Exposure to Respirable Crystalline Silica**. **The Emergency Temporary Standard (ETS) changes to section 5204 go into effect beginning December 29, 2023 to better address this silicosis epidemic in the workplace**.

What must employers do?

Effectively implement section 5204 —**including all the ETS requirements** — in their workplaces if the work their employees are performing meets the scope and application of this standard. This fact sheet only provides an overview. Employers must refer to section 5204 for details on all the requirements and definitions.

Summary of the ETS changes

- **Where there is any employee exposure to airborne RCS**. Employers must:
  - Promptly (within 24 hours) report any confirmed RCS exposure-related silicosis or cancer case to the California Department of Health and Cal/OSHA.
  - Communicate RCS exposure hazards to employees in a language they understand and appropriate for their level education and literacy. This includes:
    - The exposure symptoms, such as cough, difficulty breathing, fatigue, shortness of breathing, weakness, fever, chest pain, or unexpected weight loss.

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- The specific tasks where there is RCS exposure, including high-exposure trigger tasks.
- The measures implemented to reduce exposures.
- How to properly use and implement engineering controls, work practices, and respiratory protection.
- The contents of section 5204.
- The purpose and description of the medical surveillance program.
- The increased risk of death associated with the combined effects of smoking and RCS exposure.
- The increased risk of tuberculosis infections becoming active.
- Encouraging employees to report any related symptoms without fear of reprisal.

- **Where there are high-exposure trigger tasks**. Employers must ensure that:
  - Employee exposures are presumed to be more than the Permissible Exposure Level (PEL) of 50 micrograms per cubic meter (ugm/m3) of air averaged over an 8-hour work shift. Initial employee exposure monitoring must be done and repeated at least every 12 months. Objective data — defined in section 5204(b)(10) — may not be used instead of or in conjunction with airborne exposure monitoring.

Affected workers, or their designated representatives, must be provided with the results and have the right to observe any monitoring—including tasks that are not high-exposure— that represents their exposures to airborne RCS.

  - All such tasks are done within regulated areas — a restricted area where an employee's exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.

    Regulated areas must be demarcated and identified according to section 5204(e) requirements and are also required for tasks not considered to be high exposure but are, or are expected to be, at or above the PEL.

  - Effective wet methods are used to reduce airborne dust exposure.
  - Housekeeping and hygiene practices include:
    - Prompt and proper dust cleanup that prevents dust accumulation and ensures no visible dust build-up in the workplace.

"Effective" is employee exposure demonstrated to be less than the AL.

"Wet methods" mean either:

- Applying sufficient water directly onto the surface of the work object. Water flow rates must equal or exceed manufacturer recommendations for the equipment used.
- Submersing the work object underwater.
- Water jet cutting.

    - Use of only wet methods or **HEPA vacuums**.
    - Respirators used according to the section 5144 respirator program requirements.
    - Readily available washing facilities.
  - The following practices are prohibited on materials, surfaces, or equipment containing crystalline silica:
    - Use of compressed air.
    - Dry clean-up of materials – e.g., sweeping or shoveling.
    - Employee rotation to reduce employee exposure to RCS.
    - Walking/moving equipment through dry dust debris.
  - The written exposure control plan also includes:
    - A record of exposure measurements demonstrating that engineering controls continuously maintain exposure levels below the AL.
    - Written procedures for the proper donning and doffing of personal protective equipment, including work clothing and respirators, that prevent exposures to airborne RCS and prevent take-home exposures

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- Documentation that workplace crystalline silica use has been properly reported to Cal/OSHA as required by section 5203.
- The procedures that ensure employees are properly trained to prevent RCS exposure.

- An effective respirator protection program is implemented according to **section 5144** requirements, and the following respirators are provided to and properly used by employees:
  - A full-face, tight-fitting powered air purifying respirator (PAPR), or a respirator providing at least equal protection, equipped with a **HEPA, N100, or P100 filter**. Organic vapor combination filter cartridges must also be used with artificial stone. Refer to section 5204(h)(3)(A) for exceptions.
  - A full-face, tight fitting positive pressure supplied air respirator when either:
    - The employee is known to be diagnosed with confirmed or suspected silicosis.
    - It is medically recommended.

Controlling employee exposures to RCS

The goal is to keep employee airborne RCS exposures at least below the PEL, and below the AL for high-exposure trigger tasks. The following outlines basic airborne RCS exposure control measures, listed by priority:

1. **Substitution**
   Where circumstances permit, substitute a high crystalline silica content stone (e.g., artificial stone) with one that has a lower crystalline content (e.g., granite, or even better, marble that has little or no crystalline silica content).

2. **Engineering Controls**
   Engineering controls include use of wet methods, isolation, and local exhaust ventilation (LEV), which have the advantage of controlling RCS at the source, before it gets into an employee's breathing zone.

   - *Wet Methods*. Wet suppression methods involve applying enough water at the area of dust generation, such that the entire surface of the work object where a tool or machine contacts the object. They can be very effective properly when designed, installed, and maintained.

     Integrated water delivery systems are designed specifically for the tool or machine being used and are usually the best. Examples include:
     - Large bridge or gantry-like saws.
     - Hand-held tools, such as angle grinders and pneumatic chippers.
     - Wet milling machines or stone routers, instead of dry.

     - Wet methods must be used for high-exposure trigger tasks. Reference section 5204(b)(17) for details.
     - Follow the manufacturer's instructions on proper application of water control methods.
     - Ensure effective preventive maintenance.

   - *Isolation*. Isolation separates employees from the dust source by containing the dust or isolating employees.
   - *Local exhaust ventilation (LEV)*. Like wet methods, LEV captures airborne dust at the source, before it gets into the employee's breathing zone. It is also critical that local exhaust systems be properly **designed, operated, and maintained** according to the manufacturer's instructions for the tool or machine being used – e.g., proper amount of air exhaust volume and design and location of the exhaust hoods. Also, exhausted air must be processed through a HEPA filter. Examples include:
     - Fixed dust collectors attached to machinery.
     - Portable dust collectors attached to power tools.

3. **Safe Work Practices**
   Safe work practices involve performing a task in a way that reduces airborne dust exposures. Examples include:

   - Prohibiting dry sweeping or the use of compressed air on surfaces or equipment. Use wet methods instead.
   - Scheduling work so that tasks that involve high exposures are performed when fewer or no employees are in the area.
   - Soaking stone slabs in water prior to cutting.

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Other 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 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)**

> T8CCR, sections 1530.1 and 1532.3 apply to construction-related operations — e.g., 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 Tech

Control of Silica Exposure in Engineered Stone Fabrication Facilities

Natural Stone Institute

Silicosis: An Industry Guide for Awareness and Prevention

NIOSH

NIOSH Workplace Safety and Health Topics

OSHA

Crystalline Silica

Stop Silicosis Forever

Ventilation

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Cal/OSHA Consultation Services at 1-800-963-9424 or **InfoCons@dir.ca.gov**
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