


# Controlling Respirable Crystalline Silica Exposure

Cal/OSHA's Silica ETS



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## Substitution

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### News

#### Australia bans engineered stone because of silicosis risk

BMJ 2023; 383:doi:https://doi.org/10.1136/bmj.n2954 (Published 15 December 2023)  
Cite this as: BMJ 2023;383:e2954

Article Related content Metrics Responses

Mixture: pigments


Author affiliations

Australia has become the first country to ban engineered stone, a popular material for kitchen and bathroom benchtops, after documenting hundreds of cases of silicosis in workers in the industry who were exposed to dust from cutting the product.


Work health and safety ministers approved a ban on the use, supply, and manufacture of engineered stone on 13 December, which will come into effect in most Australian jurisdictions in July 2024.

Clinicians, unions, and medical organisations, including the Thoracic Society of Australia and New Zealand and the Cancer Council Australia, welcomed the news.

The society's president, Anne Holland, head of respiratory research at Monash University and Alfred Health in



## Hierarchy of Controls



**Elimination** - Physically remove the hazard

**Substitution** - Replace the hazard

**Engineering Controls** - Isolate people from the hazard

**Administrative Controls** - Change the way people work

**PPE** - Protect the worker with Personal Protective Equipment

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## Engineering Controls – Wet Methods

Train workers on wet methods:

- Flow rates – measure to verify
- Use the right tool for the job
- Use sharp blades
- Have a pre-work inspection
  - Electrical safety
  - Check for damage
  - Replace worn out pads and discs



waterfed air polisher



angle grinder retrofit with water nozzle

**NEVER REMOVE GUARDS TO FIT DUST CONTROLS**



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## Substitution

### High silica


SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance  
See section 1.

3.2. Mixture: These products are composed of inorganic mineral that include crystalline silica (quartz and cristobalite), ceramic glazes, polymers, metal powders, pigments, and additives. Certain products may contain titanium dioxide (8-9%), copper (0-2.0%) and/or nickel (0-0.5%). The product composition varies based on the specific product.

Name	Synonyms	Product Identifier	% *	GHG Ingredient Classification
Quartz	Quartz (SiO <sub>2</sub> ) / Silica crystalline, quartz / Crystalline silica, quartz / Silica, quartz / Silica, crystalline / Cristobalite	(CAS-No.) 14808-90-7 (CAS-No.) 14664-48-1	> 87 STOT RE 1, H372	
Silicon	Silicon powder / Silicon powder, amorphous	(CAS-No.) 7440-21-1	< 9	Comb. Dust
Titanium dioxide	TiO <sub>2</sub> / Titanium dioxide / Titanium dioxide (TiO <sub>2</sub> ) / Titanium (IV) oxide / C.I. Pigment white 6 / Titanium White 6 / Titanium dioxide, rutile form / Titanium dioxide, anatase form	(CAS-No.) 13463-67-7	< 5	Carc. 2, H351
Copper (in some Alloy Collection products)		(CAS-No.) 7440-50-8	1-2	Not classified as hazardous
Nickel (in some Alloy Collection products)		(CAS-No.) 7440-02-0	< 0.5	Carc. 2, H351 STOT RE 1, H372 Sen-Sens. 3, H317

\* Percentages are listed on weight-by-weight percentage (wt/wt) for liquid and solid ingredients. Gas ingredients are listed in volume-by-volume percentage (v/v).



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## Engineering Controls – Wet Methods





Experimental setup for wet operations using sheet flow wetting via a perforated water distribution manifold.

Ann Work Expo Health, Volume 61, Issue 6, July 2017, Pages 717-723. <https://doi.org/10.1093/annhyf/61/6/717>



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### Engineering Controls – Wet Methods

Maintain your onsite water filtration systems

Consider water temperature

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### Administrative Controls – Housekeeping




Don't forget the breakroom

Provide personal washing facilities, stocked with soap and disposable towels

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### Administrative Controls – Housekeeping




Imminent hazard = shop closure

700 ft<sup>3</sup>



~1000µg respirable crystalline silica / 20 m<sup>3</sup> = 50µg/m<sup>3</sup>

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### Administrative Controls – Regulated Area




**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

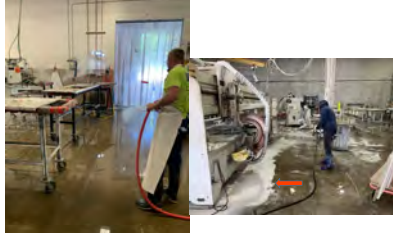
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### Administrative Controls – Housekeeping



- Start with wide spray, then use a narrow, forceful stream
- Collect wastes in leak-tight containers or bags
- Hose down often
- Use respiratory protection
- Ensure proper footwear

**ANY USE OF COMPRESSED AIR OR DRY CLEAN-UP OF WASTE IS PROHIBITED**



Excellent housekeeping!

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### Administrative Controls – Employee Rotation **PROHIBITED**




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### Administrative Controls – Procedures and Training

- Train workers about:
  - Health hazards of silica exposure
  - Symptoms of exposure
  - Workplace tasks with exposure
  - Controls to reduce exposure for each task and how to use properly
  - Purpose of medical surveillance

State Fund's Silica Exposure Control Plan template

### Additional Resources

- State Fund Loss Prevention/Industrial Hygiene Services
  - [SafetySupport@scif.com](mailto:SafetySupport@scif.com)
- Cal/OSHA Consultation
- AIHA Consultants Listing/BGC Public Roster
- [DIR.ca.gov/dosh](http://DIR.ca.gov/dosh)
- CDPH/Occupational Health Branch
- [SafeAtWorkCA.com](http://SafeAtWorkCA.com)

### Administrative Controls – Online Training Resources

- Oregon:** Silica Safety online OSHA. Take the course. Module content.
- Georgia:** Georgia Tech Safety, Health, Environmental Services. Control of Silica Exposure in Engineered Stone Fabrication Facilities.
- Natural Stone Institute:** Silica and Slab Safety.

### Silicosis is 100% Preventable

### PPE – Respiratory Protection

- PAPRs required:
  - High-exposure trigger tasks
  - Housekeeping after high-exposure tasks
  - Clean-up or handling wastes
  - Work within regulated area where high-exposure trigger tasks occur

Tight-Fitting Powered Air-Purifying Respirator (PAPR) APF=1,000 Needs to be fit tested

Images by OSHA  
<https://www.osha.gov/sites/default/files/publications/3384mail-entry-for-respiratory-protection-standard-rev.pdf>

### Need Workers' Compensation Insurance?

www.StateFundCA.com

**STATE COMPENSATION FUND** Thank You

For all your safety resources please visit  
[SafeAtWorkCA.com](http://SafeAtWorkCA.com)



For more information:  
[www.safeatworkca.com](http://www.safeatworkca.com)  
[www.statefundca.com](http://www.statefundca.com)

**STATE COMPENSATION FUND** Questions?



Link to Silica ETS survey



Your feedback is valued and used for future outreach.  
Thank you for your time!