

Lung disease caused by engineered stone



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Quartz
Cuarzo

 Choose Your Color

A	B	C	D
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154 162 170 178

	A	B	C	D
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159 167 175 183

Choose Your Edge Profile

	A	B	C
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10

Journal of Management Education

B

517

(continued)

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1990

A ^B 117 —

Associate of

Ask an Assessor
www.assessor.com/de

Protein

10

Stonemark Granite



neckless Selections

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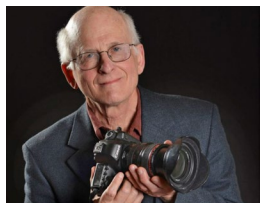
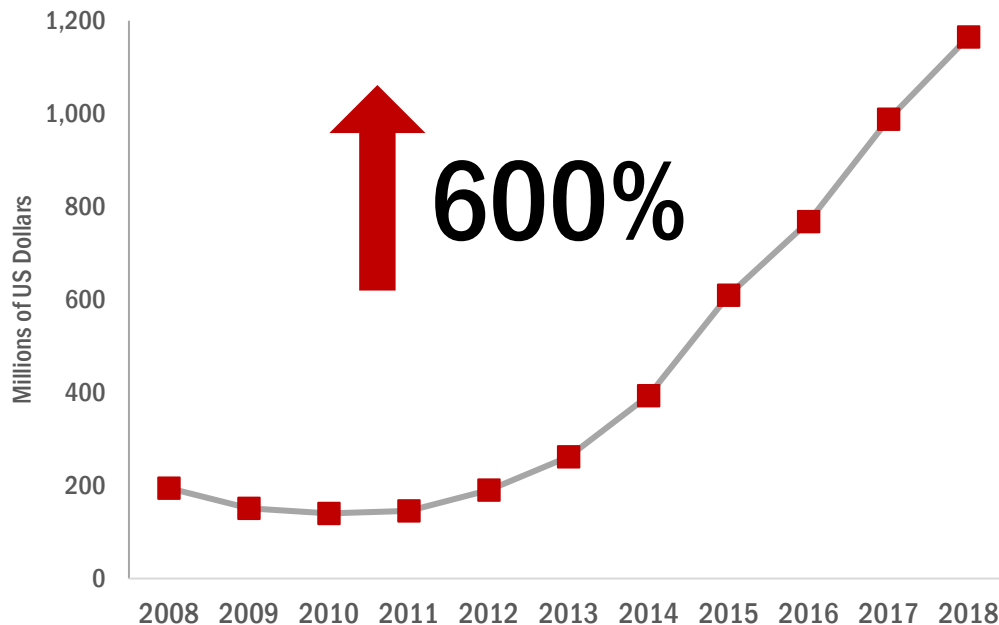


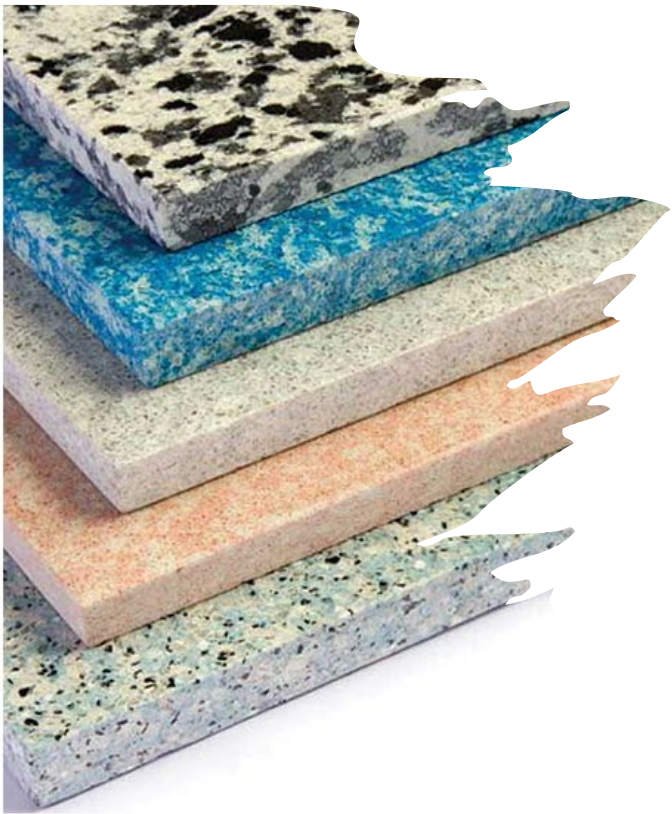
Photo credit: Earl Dotter

Engineered stone: an emerging threat



Quartz surface imports to the United States, 2008-2018





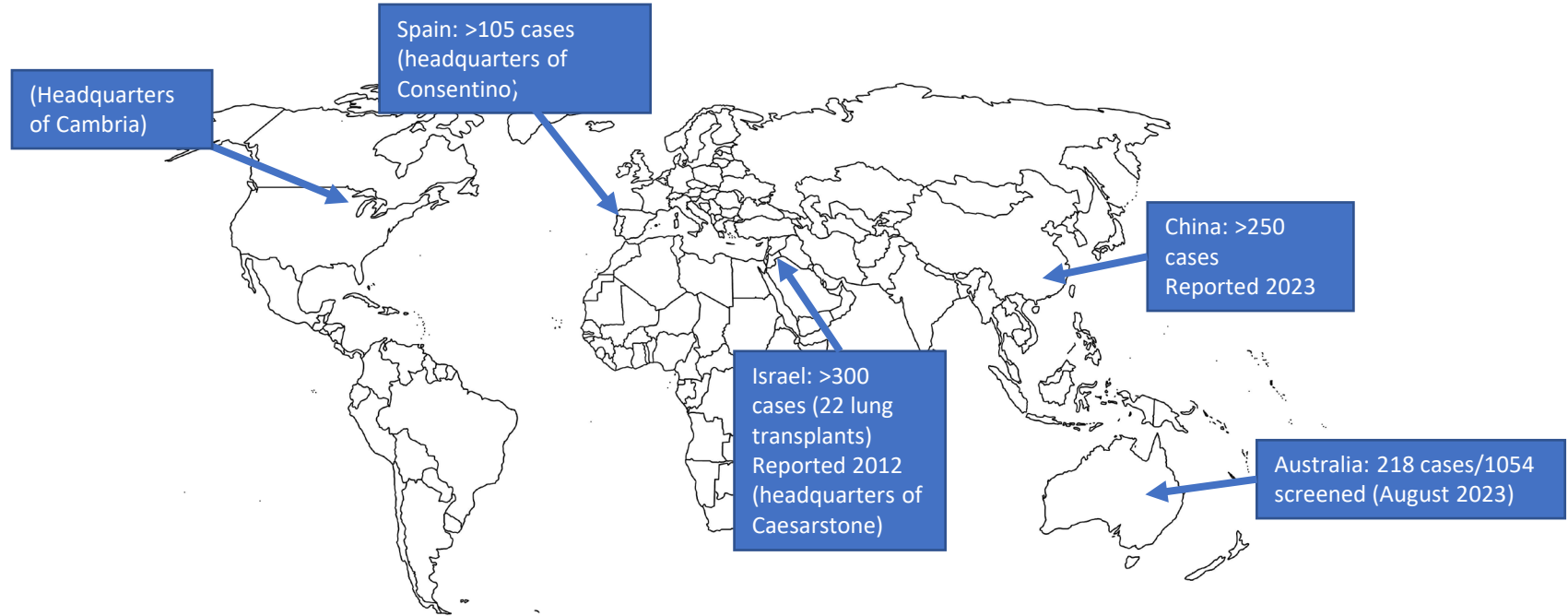
Engineered stone

- Alternative to marble, granite or laminate countertops
- Composite material: crushed quartz (SiO_4) bound together with polymer resins, pigment, glass, and other additives
- AKA: artificial, agglomerate, quartzite
- Brand names: Silestone, Caesarstone

Stone	Average % Silica
Engineered stone	≥93
Quartzite	95
Quartzitic sandstone	90
Sandstone	60
Granite	10 - 45
Slate	Varies
Soapstone	Varies

Sources: Silica Hazards from Engineered Stone Countertops, NIOSH Science Blog, March 2014; ASTM C616, *Standard Specification for Quartz-Based Dimension Stone*; American Geological Institute, *Dictionary of Geological Terms*

Global Emergence of Engineered Stone associated Silicosis



Silica Hazards from Engineered Stone Countertops

March 11, 2014 by Karen Worthington, MS, RN, COHN-S; Margaret Filios, SM, RN; Mary Jo Reilly, MS; Robert Harrison, MD, MPH; and Kenneth D. Rosenman, MD



A new engineered stone countertop product known as “quartz surfacing,” was created in the late 1980s by combining quartz aggregate with resins to create a product for use in home building and home improvement. Manufacturing of this material, including products such as CaesarStone™, Silestone™, Zodiaq™, or Cambria™ is a fast growing industry. First made in Israel and Spain, production of these materials has grown world-wide, driving quartz slab imports to the U.S. up 63% between 2011 and 2012 and 48% between April 2012 and April 2013

(Schwartzkopf 2013, StatWatch 2013). Quartz surfacing materials may contain up to 93% crystalline

Popular Quartz Countertops Pose a Risk to Workers

By BARRY MEIER APRIL 1, 2016



As sleek “engineered stone” countertops grow in popularity, safety experts are warning that workers who handle them are at particularly high risk from an old workplace hazard — silica, the mineral tied to [silicosis](#), a debilitating and potentially deadly lung disease.

The countertops are made from processed quartz, a material containing silica levels as high as 90 percent, or twice the amount found in granite.

Morbidity and Mortality Weekly Report (MMWR)

[MMWR](#)



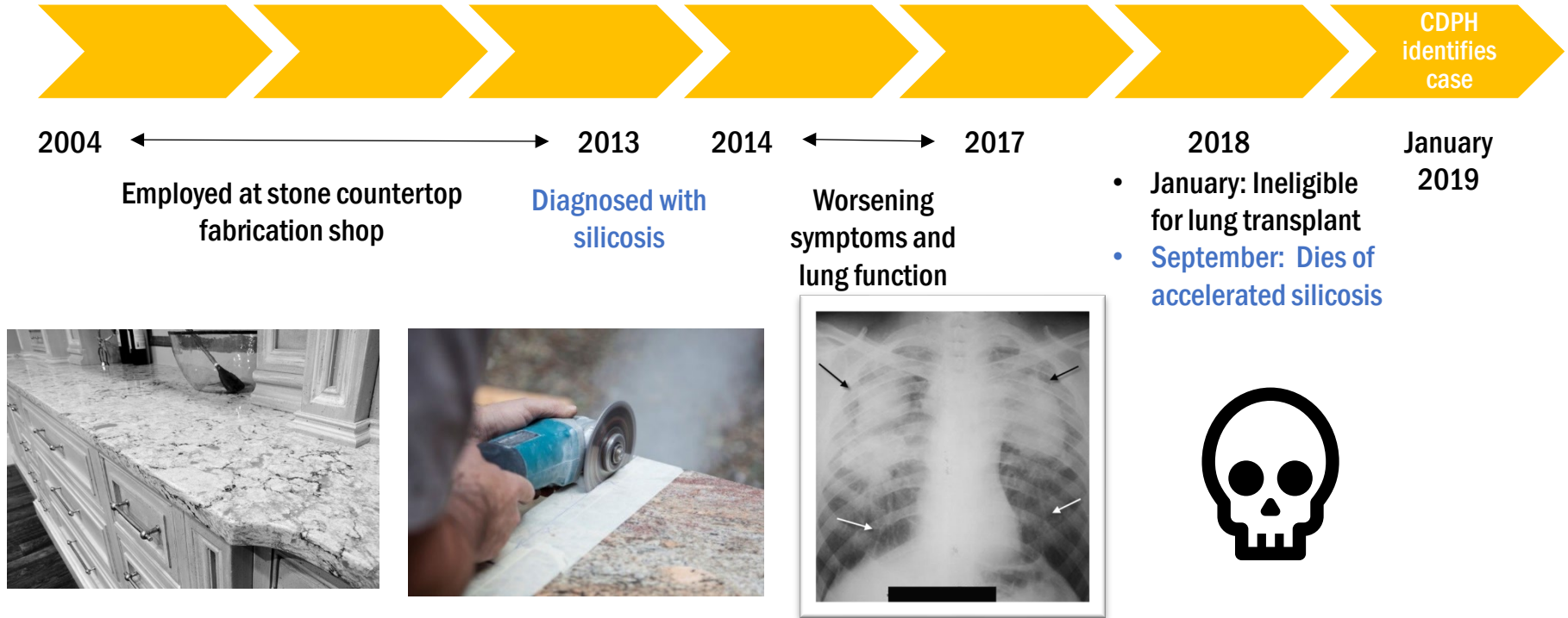
Notes from the Field: Silicosis in a Countertop Fabricator — Texas, 2014

Weekly

February 13, 2015 / 64(05);129-130

Gary K. Friedman, MD¹, Robert Harrison, MD², Heidi Bojes, PhD³, Karen Worthington, MS⁴, Margaret Filios, MSc⁵ (Author affiliations at end of text)

Sentinel California Case Identification Timeline





Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Morbidity and Mortality Weekly Report (*MMWR*)

CDC

Severe Silicosis in Engineered Stone Fabrication Workers — California, Colorado, Texas, and Washington, 2017–2019

Weekly / September 27, 2019 / 68(38);813–818

Cecile Rose, MD^{1,2*}; Amy Heinzerling, MD^{3,4*}; Ketki Patel, MD, PhD⁵; Coralynn Sack, MD^{6,7}; Jenna Wolff¹; Lauren Zell-Baran, MPH^{1,8}; David Weissman, MD⁹; Emily Hall, MPH⁵; Robbie Sooriash, MD⁵; Ronda B. McCarthy, MD¹⁰; Heidi Bojes, PhD⁵; Brian Korotzer, MD¹¹; Jennifer Flattery, MPH³; Justine Lew Weinberg, MSEHS^{3,12}; Joshua Potocko, MD¹³; Kirk D. Jones, MD¹⁴; Carolyn K. Reeb-Whitaker, MS¹⁵; Nicholas K. Reul, MD^{6,7,16}; Claire R. LaSee, MPH, MSW¹⁵; Barbara L. Materna, PhD³; Ganesh Raghu, MD⁶; Robert Harrison, MD³ ([VIEW AUTHOR AFFILIATIONS](#))

How many cases are there?

Stone fabrication:

~ 10,000 establishments
>100,000 workers

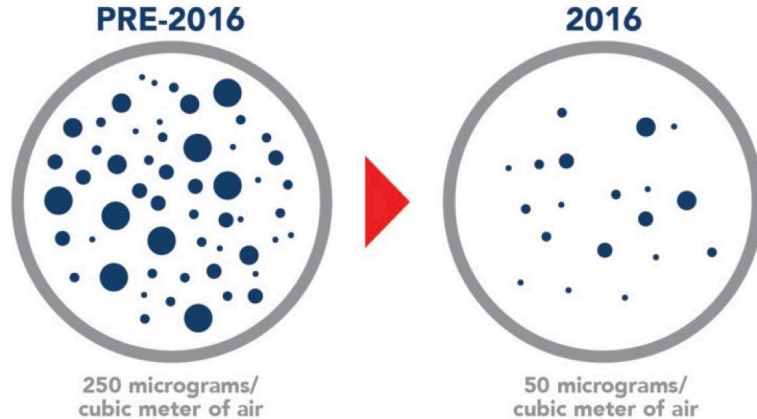


OSHA Silica Standard for Employers



DSG FS-3682 02/2018

IN 2016, OSHA REDUCED THE PEL OF RESPIRABLE CRYSTALLINE SILICA AVERAGED OVER AN 8-HOUR SHIFT BY 5X.



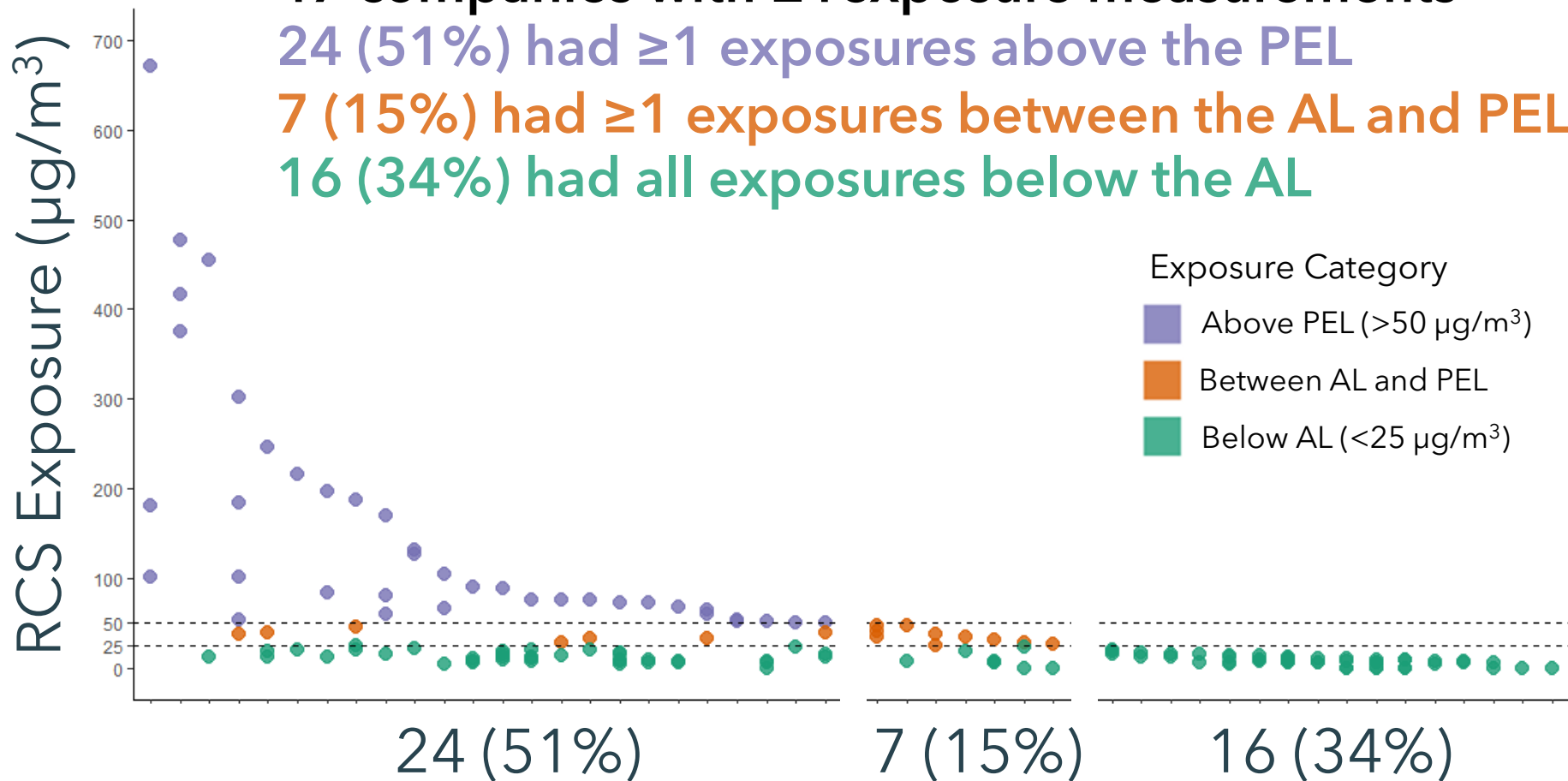
- **Determine** amount of **exposure**
 - Action level: 25µg/m³
 - Permissible Exposure Limit: 50µg/m³
- Use **dust controls** and safer work measures
- Written **exposure control plan**
- **Train workers** on health effects
- Offer **medical exams**
- **Keep records** of exposures and medical exams

47 companies with ≥ 1 exposure measurements

24 (51%) had ≥ 1 exposures above the PEL

7 (15%) had ≥ 1 exposures between the AL and PEL

16 (34%) had all exposures below the AL

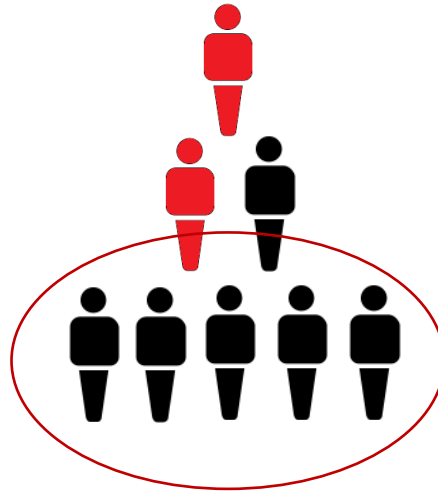


Worker interviews (n=92)

- Young (< 40)
- < 4 years at work
- ¼ cutting stone dry
- no silica medical exams

Public health follow up

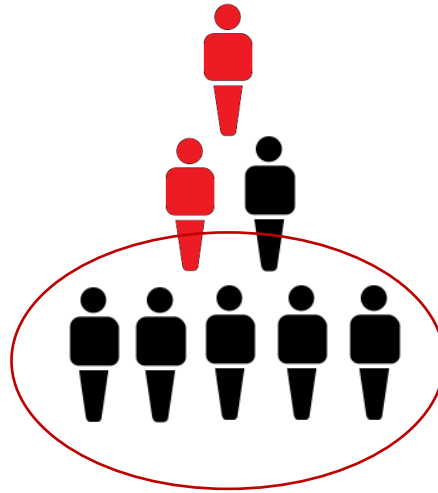
Employer screening of
43 employees in
California screened
with Chest X-ray and
PFT



12%

Public health follow up

Screening of 544
employees in Australia
screened with CT
Chest



22%

JAMA Internal Medicine | Original Investigation

Silicosis Among Immigrant Engineered Stone (Quartz) Countertop Fabrication Workers in California

Jane C. Fazio, MD; Sheiphali A. Gandhi, MD, MPH; Jennifer Flattery, MPH; Amy Heinzerling, MD, MPH; Nader Kamangar, MD, MS; Nawal Afif, DO; Kristin J. Cummings, MD, MPH; Robert J. Harrison, MD, MPH



Undocumented
Uninsured
Unprotected

COUNTRY OF ORIGIN

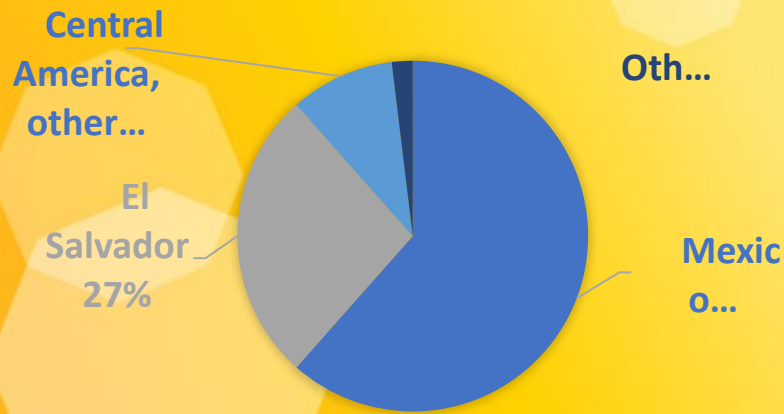


Table 3. Health Care Utilization of Patients With Engineered Stone-Associated Silicosis

Health care utilization characteristic (No. with data available)	Overall (n = 52), No. (%)
Health insurance (52)	
Uninsured or self-pay	10 (19)
Restricted-scope Medi-Cal	20 (38)
Full-scope Medi-Cal	7 (13)
Private insurance	8 (15)
Medicare	0 (0)
Workers' compensation	7 (13)
Location of initial presentation (52)	
Emergency department	25 (48)
Outpatient clinic	19 (37)
Medical surveillance	8 (15)
Emergency department (52)	
Ever visited emergency department (52)	42 (82)
No. of emergency department visits (42), median (IQR)	2.50 (1.00-4)
Hospitalization (51)	
Ever hospitalized for breathing	31 (61)
No. of times hospitalized (31), median (IQR)	2.0 (1-3.5)
Cumulative hospital length of stay per patient (30), median (IQR), d	9.5 (4.3-19.8)

Undocumented Uninsured Unprotected



Occupational history

Years of work in engineered stone industry (51), median (IQR)	15 (10-20)
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Continued working after diagnosis (52)

Still working	25 (48)
Not working	18 (35)
Unknown	9 (18)

Engineering controls: water suppression methods (51)	23 (45)
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Respirator use (47)

Sometimes	35 (74)
Always	12 (26)

Type of respirator (37)

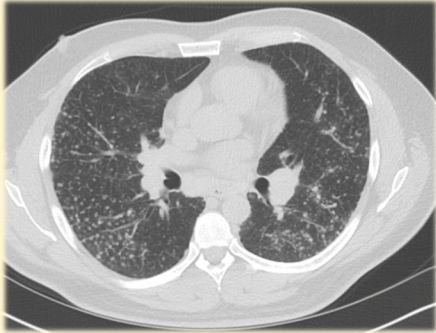
N-95	33 (89)
Half-face respirator	17 (46)
Full-face respirator	2 (5)

No. of employees in workshop (35)

<10	17 (49)
10-50	17 (49)
>50	1 (2)

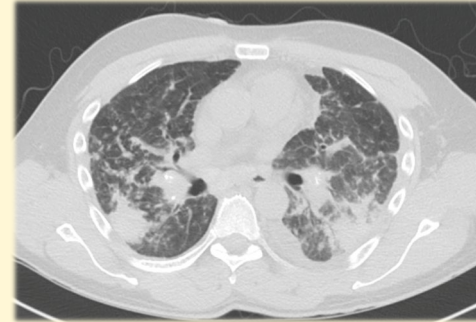
Present with advanced disease

Simple



62%

Complicated



38%

15% fatal and counting....



Artificial Stone Silicosis

Disease Resurgence Among Artificial Stone Workers

*Mordechai R. Kramer, MD, FCCP; Paul D. Blanc, MD, MSPH, FCCP;
Elizabeth Fireman, PhD; Anat Amital, MD, FCCP; Alexander Guber, MD, FCCP;
Nader Abdul Rhahman, MD; and David Shitrit, MD*

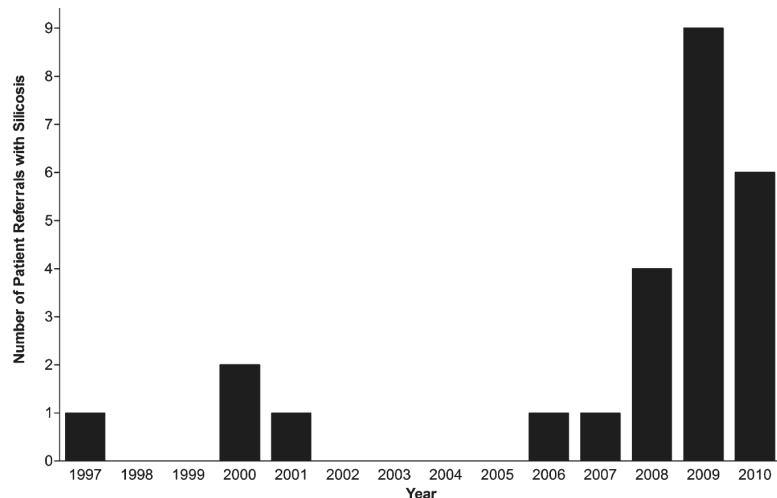
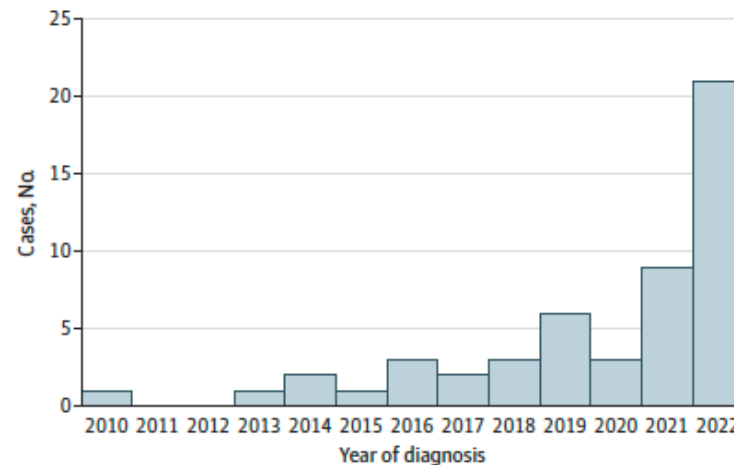


FIGURE 1. Reported cases of silicosis due to engineered stone among lung transplant candidates in Israel.

Kramer et al 2012

Figure 1. Yearly Case Counts for 52 Patients With Engineered Stone-Associated Silicosis in California, 2010-2022



Fazio et al 2023

California Fast-Tracks Rules to Protect Stonecutters From 'Horrible' Deaths



LISTEN

By Farida Jhabvala Romero Jul 22 Save Article



Leobardo Segura-Meza, 27, speaks to California workplace regulators via video on July 20, 2023, while his wife Mirian looks on. Segura-Meza, who requires an oxygen tank at all times to breathe, was diagnosed last year with silicosis after working for 10 years cutting engineered stone countertops. (From Cal/OSHA meeting screenshot)

- Trigger tasks
- Wet methods
- Regulated areas
- PAPRs

California embraces emergency rules to protect countertop workers from incurable silicosis



Stone countertop fabricators at work in Sun Valley this fall. (Brian van der Brug / Los Angeles Times)

BY EMILY ALPERT REYES | STAFF WRITER

DEC. 14, 2023 UPDATED 3:55 PM PT

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**Community, employer &
worker outreach**

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Education and assistance

Medical testing

Case reporting



Australia makes world-first decision to ban engineered stone following surge in silicosis cases

By the Specialist Reporting Team's [Leonie Thorne](#) and national consumer affairs reporter [Michael Atkin](#)

Posted Tue 12 Dec 2023 at 11:20pm, updated Wed 13 Dec 2023 at 3:33am



Engineered stone has become a popular product in kitchens for its affordability and durability. (Unsplash: Christian Mackie)

Hierarchy of Controls

Most
effective



Least
effective

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

Silicosis: a serious issue

Today, there is a growing policy focus on restricting the trade of products with high crystalline silica content.

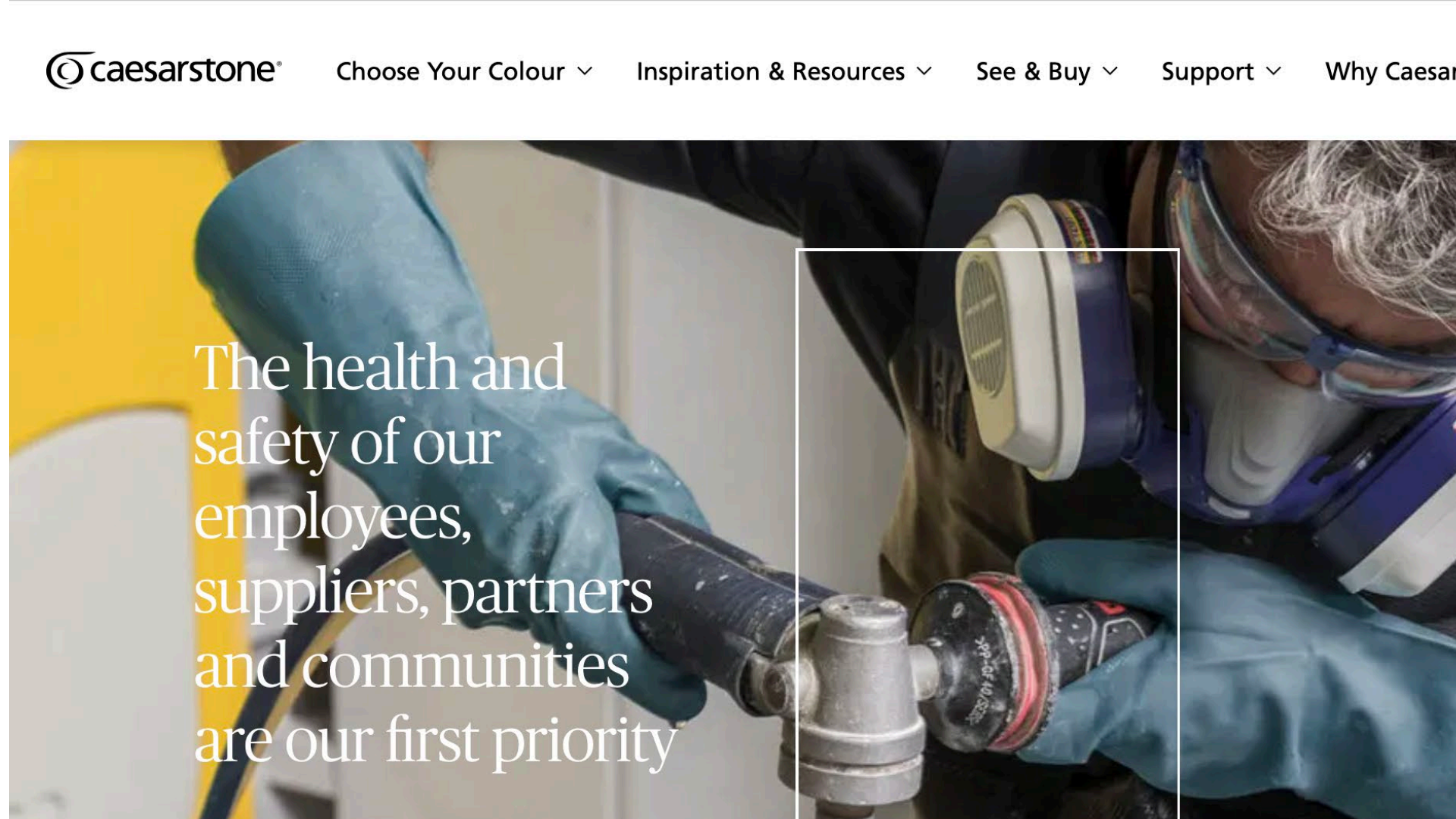
The market demands a new industrial raw material free from crystalline silica while maintaining the same features of natural quartz aggregates.



Silicosis: a serious issue

The solution

Advantages

A close-up photograph of a worker wearing blue nitrile gloves and a respirator mask, using a pneumatic tool on a surface. The worker's face is partially visible through the respirator. The background is slightly blurred, showing a yellow and white structure.

The health and
safety of our
employees,
suppliers, partners
and communities
are our first priority



Pioneering the Caesarstone Mineral™ Crystalline Silica-Free revolution

Introducing the next generation surfaces –
premium, sustainable designs formulated with
a unique blend of materials.

[View The XRD Test Results →](#)



What is the difference between Caesarstone Mineral™ crystalline silica-free and the recently banned engineered stone?

Both of these products are manufactured in the same way, the major difference being in the raw material, engineered stone is classified as an artificial product that: a) is created by combining and heat curing natural stone materials that contain crystalline silica (such as quartz or stone aggregate) with chemical constituents (such as water, resins or pigments). Our Caesarstone Mineral™ material blend is made from recycled glass, polymer resins and pigment.

Got It ✓

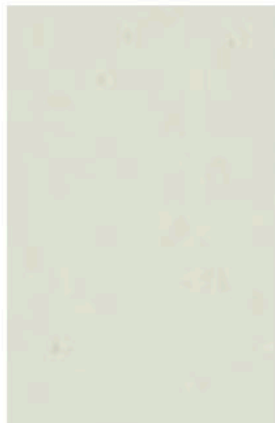
What is the Caesarstone Mineral™ Crystalline Silica-Free Collection?

The collection is a curated range of our most loved designs, which will be transitioning to a crystalline silica-free material blend in line with the new government regulations.

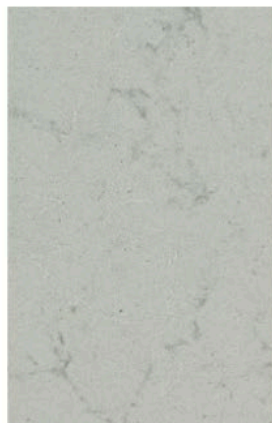
View the designs transitioning throughout 2024.



5130
Cosmopolitan White™ P M1



4001
Fresh Concrete™ C M1

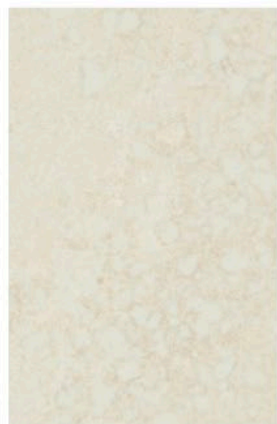


6134
Georgian Bluffs™ P M1

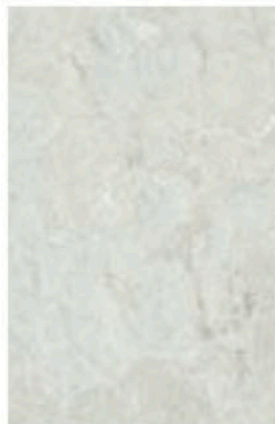


4030
Oyster™ P M0

Scan below to check
the latest availability
of designs in the
crystalline silica-free
material blend.



5222
Adamina™ N M3



6131
Bianco Drift™ P M2



4004
Raw Concrete™ C M1



4120
Raven™ P M0

Safer alternatives to engineered stone containing RCS in California

- Consumer demand
- Regulatory compliance
- Medical and public health impact

