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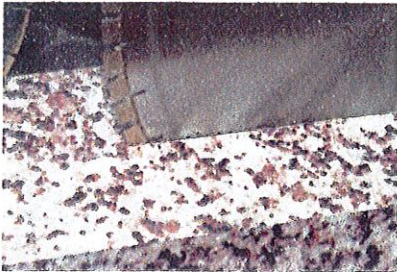
Tina Mrozinski

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## Silica Hazards from Engineered Stone Countertops

Posted on 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



(<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/countertop/>)

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 silica (Dupont 2010). In contrast, the percent of crystalline silica in a slab of granite is less than 45%, darker color granite has a lower percentage (Simcox et al. 1999). Workers who fabricate and install quartz surfacing are at risk for

overexposure to silica released during sizing, cutting, grinding and polishing. Prolonged inhalation of dust from silica-containing materials can lead to silicosis (scarring of the lungs). In addition to silicosis, scientific evidence indicates that occupational exposure to crystalline silica puts workers at increased risk for other serious health conditions: chronic obstructive lung disease, lung cancer, kidney and connective tissue disease, and tuberculosis. The focus of this blog is on silicosis, which has occurred in multiple workers in this industry.

### Silicosis

Silicosis is caused by breathing in very fine (“respirable”) dust containing crystalline silica. Initially, individuals may be developing disease even without respiratory symptoms. Chronic silicosis typically develops over 10 or more years of exposure to low levels of respirable crystalline silica. However, high levels of exposure can cause faster development of the disease. The diagnosis is usually made through a chest radiograph, which should be classified by a [NIOSH-certified Reader](http://www.cdc.gov/niosh/topics/chestradiography/breader-list.html) (<http://www.cdc.gov/niosh/topics/chestradiography/breader-list.html>).

Cases of silicosis have been reported among engineered stone countertop workers in other countries. In a study published in 2012, researchers in Israel found 25 patients referred to their National Lung Transplantation Program with silicosis who shared a common exposure history. All had worked with the same commercial brand of decorative quartz surfacing material for 10–14 years and performed similar dry-cutting of the material for kitchens and other countertop applications (Kramer et al. 2012). Most recently, 46 cases of silicosis were reported in Spain in workers cutting and installing engineered stone countertops with silica content of 70–90% (Pérez-Alonso et al. 2014). These individuals were young (ages 29–37 years) and worked in the industry for 9–17 years.

While no reported cases of silicosis in the U.S. have been linked to quartz surfacing materials, recent research indicates that exposures to silica-containing dust while working with these materials may approach or exceed the Occupational Safety and Health Administration (OSHA) current Permissible Exposure Limit (PEL) (Phillips et al. 2013). Multiple inspections by OSHA (U.S. Department of Labor) have documented overexposures to silica at stone fabrication shops working with a combination of natural stone and quartz surfacing materials (OSHA 2011). These overexposures would indicate U.S. workers in this industry are at risk of developing silicosis as well as the other multiple health conditions associated with silica exposure.

### Protecting Workers

We can apply what we know about reducing exposure to dusts from natural stone products to quartz surfacing materials. The key to prevention is keeping dust out of the air. Hazard alerts published in [California](http://www.dir.ca.gov/dosh/dosh_publications/GraniteHazardAlert.doc) ([http://www.dir.ca.gov/dosh/dosh\\_publications/GraniteHazardAlert.doc](http://www.dir.ca.gov/dosh/dosh_publications/GraniteHazardAlert.doc)) and [Washington State](http://www.lni.wa.gov/Safety/Basics/HazAlerts/hazmay98.asp) (<http://www.lni.wa.gov/Safety/Basics/HazAlerts/hazmay98.asp>) described exposure to silica dust and other hazards related to fabrication of granite and natural stone products and provided dust control recommendations. Whenever possible, cutting, grinding and shaping should be done wet. Ventilation and filtration systems should be used to collect silica-containing dust at its source. If these engineering controls fail to eliminate the risk, then use of at least a NIOSH-approved N95 respirator is recommended.

In addition to information and resources on silica and silicosis for employers and employees provided by NIOSH and OSHA, the Center for Construction Research and Training’s website “[Work Safely with Silica](http://www.silica-safe.org/) (<http://www.silica-safe.org/>)” is searchable by work task, material and tool.

### Help Wanted

There is relatively little sampling data available on quartz surfacing materials. NIOSH encourages fabricators to submit a request for a Health Hazard Evaluation (HHE). More information can be found on the [HHE Topic Page](http://www.cdc.gov/niosh/hhe/HHEprogram.html) (<http://www.cdc.gov/niosh/hhe/HHEprogram.html>). Researchers at NIOSH are especially interested in seeing a state-of-the-art engineered stone countertop manufacturing facility to help us understand how to best control exposures to quartz surfacing material. If you are interested in working with NIOSH, you can contact us using the comment section below, e-mail us at [nioshblog@cdc.gov](mailto:nioshblog@cdc.gov) (<mailto:nioshblog@cdc.gov>), or submit an HHE at the link provided above.

Finally, if individuals working with countertops have health problems or are concerned about past exposures, they should see a healthcare provider and inform them about their concerns. Healthcare providers who suspect that their patients' health problems may be caused by working with quartz-containing materials are encouraged to report their concern to their state health department.

## Web Pages of Interest

- [NIOSH Silica Topic Page \(http://www.cdc.gov/niosh/topics/silica/\)](http://www.cdc.gov/niosh/topics/silica/)
- [NIOSH Engineering Controls for silica in Construction \(http://www.cdc.gov/niosh/topics/silica/constructionControlMain.html\)](http://www.cdc.gov/niosh/topics/silica/constructionControlMain.html)
- [NIOSH Occupational Respiratory Disease Surveillance \(http://www.cdc.gov/niosh/topics/surveillance/ords/\)](http://www.cdc.gov/niosh/topics/surveillance/ords/)
- [OSHA Silica Crystalline \(https://www.osha.gov/dsg/topics/silicacrystalline/index.html\)](https://www.osha.gov/dsg/topics/silicacrystalline/index.html)
- [CPWR Work Safely with Silica \(http://www.silica-safe.org/\)](http://www.silica-safe.org/)
- [NJ Department of Health and Senior Services Silicosis Surveillance \(http://www.nj.gov/health/silicosis/index.shtml\)](http://www.nj.gov/health/silicosis/index.shtml)
- [MSU Occupational & Environmental Medicine, Silicosis \(http://www.oem.msu.edu/Silicosis.aspx\)](http://www.oem.msu.edu/Silicosis.aspx)

## References

[Click here for the references used in this blog entry. \(http://blogs-origin.cdc.gov/niosh-science-blog/countertop-blog-references\)](http://blogs-origin.cdc.gov/niosh-science-blog/countertop-blog-references)

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## 51 comments on "Silica Hazards from Engineered Stone Countertops"

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**constructeur de maison 77** says:

March 12, 2014 at 7:09 am (<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/#comment-142128>)

I am an architect and I am always eager to see the creativity of others, relevant article.

Reply (<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/?replytocom=142128#respond>)

**Clayton Doak** says:

March 13, 2014 at 1:42 pm (<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/#comment-143943>)

This is important information since it draws attention to a silica exposure hazard. I am concerned that the term "engineered stone" does not warn workers about the potential silica exposure. Maybe "engineered silica stone" or "engineered quartz counter top" would be better.... Descriptive terminology in this case appears to be critical.

Reply (<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/?replytocom=143943#respond>)

**Karen Worthington, Margaret Filios, Mary Jo Reilly, Robert Harrison and Kenneth D. Rosenman** says:

March 14, 2014 at 3:05 pm (<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/#comment-145254>)

Thank you for your comment. As this is a relatively new product, the terminology is still evolving. At present, "quartz surfacing materials" appears to be the term preferred within the industry. As we continue to work in this area we can help refine the terminology used by safety and health professionals.

**George Kilens, CIH** says:

March 17, 2014 at 10:49 am (<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/#comment-148876>)

Great article! We (OSHA) actually found worker silica exposures (via personal sampling) to be 50% of the OSHA PEL during stone cutting and polishing work under very wet operating conditions (no local exhaust used). The product was either Silestone™ or Zodiaq.

Reply (<https://blogs-origin.cdc.gov/niosh-science-blog/2014/03/11/countertops/?replytocom=148876#respond>)