
Silica Exposure Training for the Cut Stone Industry



SH37200SH1

Training on the identification, evaluation, and control of silica exposure in cut stone and stone fabrication industries



Georgia Tech Enterprise Innovation Institute
Safety, Health, and
Environmental Services

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Developed by:



Georgia Tech Enterprise Innovation Institute
**Safety, Health, and
Environmental Services**

Funded by:

U.S. Department of Labor
Occupational Safety and Health Administration
Susan Harwood Training Grant Program

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Introduction: About the Instructors Guide and Course Organization

About the Instructor Guide

The instructor guide is designed to be a comprehensive tool for facilitating the course. Thoroughly reviewing this document, as well as all related course materials and resources, will prepare you to teach the course. The format for each page of the main instructional content is listed and described below. This information is provided so you can utilize these elements appropriately and effectively as you prepare to teach.

Slides

The facilitation of the course is supported by a PPT presentation or the use of videos. Each slide in the presentation is displayed in the instructor guide, with the script from the video next to the corresponding slide or images. The scripts can also be found in the notes section of each PowerPoint slide.

Resources

At the end of each lesson, there will additional resources to provide the course facilitator the opportunity to engage the class in discussion and answer any questions.

Course Description

This course was produced under grant number SH-37200-SH1 from the Occupational Safety and Health Administration, U.S. Department of Labor as part of a targeted topic training on respirable crystalline silica exposure in cut stone and stone fabrication facilities. The training covers how stone fabrication using engineered stone relates to the silica standard, a description of silica exposure control methods available for fabrication, physical and health hazards associated with exposure to silica when fabricating engineered stone, respiratory protection, and how to report a concern in the workplace. The focus audience includes stakeholders in cut stone and stone fabrication facilities, including: employers and workers, especially low-literacy, English as a second language and non-English speaking employees. Training materials have been developed in English and Spanish and include MS PowerPoint slide decks, this instructor guide, and videos with translated voiceover recordings. The online training videos area available for free through the SHES YouTube channel, with the MS PowerPoint slide decks and instructor guides posted to the SHES website: oshainfo.gatech.edu/.

Target Audience Description

OSHA currently has a National Emphasis Program to reduce or eliminate employee exposure to respirable crystalline silica exposure in the general, maritime and construction industries (CPL 03-00-023). One major challenge faced by employers in these targeted industries is the lack of understandable information related to the airborne exposure to silica for employees with little to no English proficiency and limited literacy to understand or read and comprehend the content contained within a safety data sheet. The target populations for this grant proposal are employers at cut stone and stone fabrication facilities and their employees. Many of these companies are also small businesses.

Course Goal

The goal of this course is to educate employers and employees about the risks associated with exposure to respirable crystalline silica during the fabrication of engineered stone (Quartz) countertops.

Course Learning Outcomes

Terminal Learning Objective (TLO) 1: Recognize respirable crystalline silica exposure

Enabling Learning Objective (ELO) 1.1 Describe respirable crystalline silica

ELO 1.2 Recognize respirable crystalline silica health effects

ELO 1.3 Recognize how exposure to engineered stone may increase risks of health effects

TLO 2 Describe respirable crystalline silica exposure assessment options

ELO 2.1 Describe the Scheduled Monitoring option

ELO 2.2 Describe the Performance option

ELO 2.3 Compare silica exposure monitoring results when work environment is control with water and ventilation versus when it is not controlled.

TLO 3 Recognize respirable crystalline silica exposure control measures

ELO 3.1 Describe an Exposure Control Plan

ELO 3.2 Describe the personal protective equipment worn when working with engineered stone

ELO 3.3 Describe medical surveillance requirements

ELO 3.4 Describe training requirements

ELO 3.5 Recognize recordkeeping requirements

Class Size

This training is designed to accommodate a minimum of 3 participants and a maximum of 40 participants when provided in a classroom setting. The videos are intended to be available to employers and employees to watch either in a group setting or on an individual basis.

Lesson One: What Makes Engineered Stone Unique

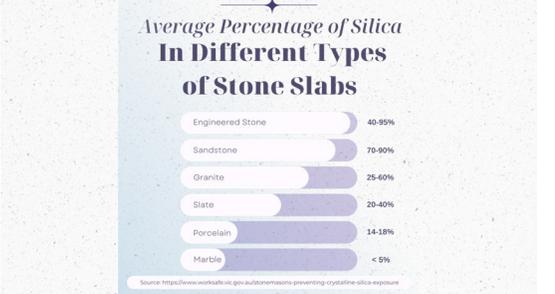
This lesson goes over the unique composition of engineered stone and how it can affect employees exposed to the dust produced from fabricating slabs of engineered stone. This lesson has two parts: the first is the story of Ever, which is described in the short film, “Stop Silicosis for Ever.” The second part of this lesson describes what makes engineered stone different from other cut stone products.

Part One: Stop Silicosis For Ever – The story of Ever, a cut stone fabricator who was diagnosed with silicosis

Have participants watch the first video in the series, titled, “Stop Silicosis for Ever.” At the end of the video, engage students in a discussion using the following questions as talking points:

- In the video, Ever mentions seeing a sticker on the slabs of engineered stone and after reading the sticker makes the determination that engineered stone is dangerous. Ask participants if they have seen these stickers on the slabs of stone, and if they have taken the time to read them. What was their interpretation of the sticker?
 - Note: these hazard communication labels will be explained in greater detail in lesson four.
- When the doctor diagnoses Ever with silicosis, he asks the doctor, “What is silicosis?” Ask the participants if they have ever heard of silicosis. If they have, where did they learn about silicosis?
- When Ever’s wife shares her experience, she expresses how difficult it has been for her to cope with her husband’s illness. Ask the participants who would be affected in their lives if they got sick.
- Ever mentions that he could tell that engineered stone was different because it burned his nose. Ask the participants to discuss if they notice any differences when working with natural stone compared to engineered stone.

What Makes Engineered Stone Different from Other Cut Stone Products

Script for Lesson	Image, Video or, Slide														
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson one: what makes engineered stone different from other cut stone products</p>															
<p>There are plenty of options when selecting countertops and other stone surfaces. One of the most popular types of countertops right now are quartz countertops. During the fabrication process, dust generated may have varying levels of respirable crystalline silica based on the type of slab being processed.</p>	<p>Video of fabrication shop</p>														
<p>Stone slabs may contain up to 95% crystalline silica. The highest silica levels are associated with engineered stone countertops. These types of countertops may contain anywhere from 40 to 95% silica, depending on the type and other adhesives and additives. Silica content is generally lower in natural stone products. Calcium-based stones, including limestone and certain varieties of marble, contain little or no silica. In contrast, granite can contain anywhere from 25 to 60% silica depending on the source of the stone and location where it was quarried. This table below describes typical silica/ quartz content of common natural and engineered stones slabs used to manufacture countertops.</p>	 <table border="1"> <caption>Average Percentage of Silica In Different Types of Stone Slabs</caption> <thead> <tr> <th>Stone Type</th> <th>Percentage Range</th> </tr> </thead> <tbody> <tr> <td>Engineered Stone</td> <td>40-95%</td> </tr> <tr> <td>Sandstone</td> <td>70-90%</td> </tr> <tr> <td>Granite</td> <td>25-60%</td> </tr> <tr> <td>Slate</td> <td>20-40%</td> </tr> <tr> <td>Porcelain</td> <td>14-18%</td> </tr> <tr> <td>Marble</td> <td>< 5%</td> </tr> </tbody> </table> <p>Source: https://www.worksafe.org.au/stone/masons-preventing-crystalline-silica-exposure</p>	Stone Type	Percentage Range	Engineered Stone	40-95%	Sandstone	70-90%	Granite	25-60%	Slate	20-40%	Porcelain	14-18%	Marble	< 5%
Stone Type	Percentage Range														
Engineered Stone	40-95%														
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Marble	< 5%														
<p>Let’s watch a clip of Ever describing what it is like to work with both natural and engineered stone.</p>															

From the clip we just watch, Ever noticed a difference when the company started fabricating engineered stone countertops. However, let's look at what makes engineered stone so different from natural stone. First, engineered stone is often referred to by lots of different names, such as quartz countertops, the brand name of the specific manufacturer of the stone slabs, or the style in which the slabs are designed. However, the process of making these types of slabs all originates from an engineering designs, hence the name engineered stone. A basic overview of the process includes taking quartz rock and crushing it down into a powder then bonding it together with resins, pigments, and other additives.



Let's take a look at an excerpt of an engineered stone slab safety data sheet. In sections 2 and 3, which covers the hazard identification and composition of the material, we can see that there is a health hazard by the symbol that shows what looks like an exploding lung. We can also see the material includes a mixture of crystalline silica or quartz, titanium dioxide, cristobalite (which is also a form of silica), other natural stone pieces, and a polyester resin mixture. This means that the silica content is somewhere between 90 and almost 100% when you combine both the quartz and cristobalite forms of silica.

SECTION 2 - Hazard Identification

Quartz products are mixtures of Natural Quartz, Resins and other naturally occurring minerals. The finished Quartz products are inert, stable, non-flammable, and pose no respiratory hazard to health. Fabrication and processing of engineered stone, for cutting, sanding, grinding, abrading, crushing, drilling, abrading or grinding, will generate dust that may contain silica or crystalline silica, quartz (respirable and ultra-fine) which exposure to such dust is dangerous to health and can cause serious illness such as silicosis, lung cancer, fibrosis of the lungs, tuberculosis, kidney disease, depression of the immune system and irritation of the skin and eyes. Quartz products are not hazardous as shipped and used by the end user.

Emergency Overview: DANGER! Lung Injury and Cancer Hazard

GHS Classification (Global Harmonized Classification): Carcinogenicity Category 1A (H350)
 Specific target organ toxicity - single exposure - Respiratory tract irritation Category 3 (H373)
 Specific target organ toxicity - repeated exposure - Category 1A (H373)
 GHS Label: Health and Precautionary Statement
 Category 1 (Respiratory tract irritation) (H350); Category 1A (Carcinogenicity) (H351)
 Hazard Statements:
 (H350) May cause CANCER (inhalation)
 (H373) May cause respiratory irritation
 Precautionary Statements:
 (P201) Do not breathe dust. (P202) Do not breathe dust. (P203) Do not breathe dust. (P204) Do not breathe dust. (P205) Do not breathe dust. (P206) Do not eat, drink or smoke when using this product. (P270) Wear protective gloves, protective clothing, eye protection, face protection. (P280) Potential health effects.
 Information: Do not breathe dust. See "Health Hazard" in Section 11 for more details.

SECTION 3 - Composition Ingredients

Composition	Chemical	Estimated % by Wt.
Crystalline silica as quartz	CAS: 14808-01-7	90-100%
Titanium Dioxide	CAS: 13463-02-2	0-10%
Cristobalite	CAS: 14464-46-1	0-10%
Other Natural Stone / Mineral?	N/A	0-10%
Polyester Resins	Mixture	0-10%

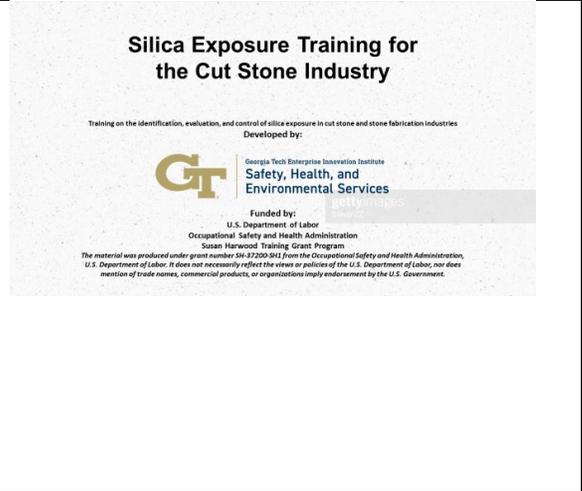
So how do we end up with slabs in a fabrication facility? The manufacturing process begins with selection of raw quartz materials. They are crushed and blended in a unique ratio of quartz, polyester resin, and other additives. The mixture is then compacted into slabs by some form of vacuum and or vibration process. This process minimizes porosity and reduces water absorption. The slabs are then cured in a kiln at a specified temperature and duration based on the mixture. The curing process may be accelerated by using ovens or steam. When curing is completed, the slabs are gauged, calibrated, polished and prepared for packing and sent to countertop companies all over the world. Because the quartz is heated up, this changes the composition of the rock so that it breaks down and grinds much easier. When this is done the material poses a much greater health risk.



Video walking around fabrication shop (slides 7-9 of power point presentation)

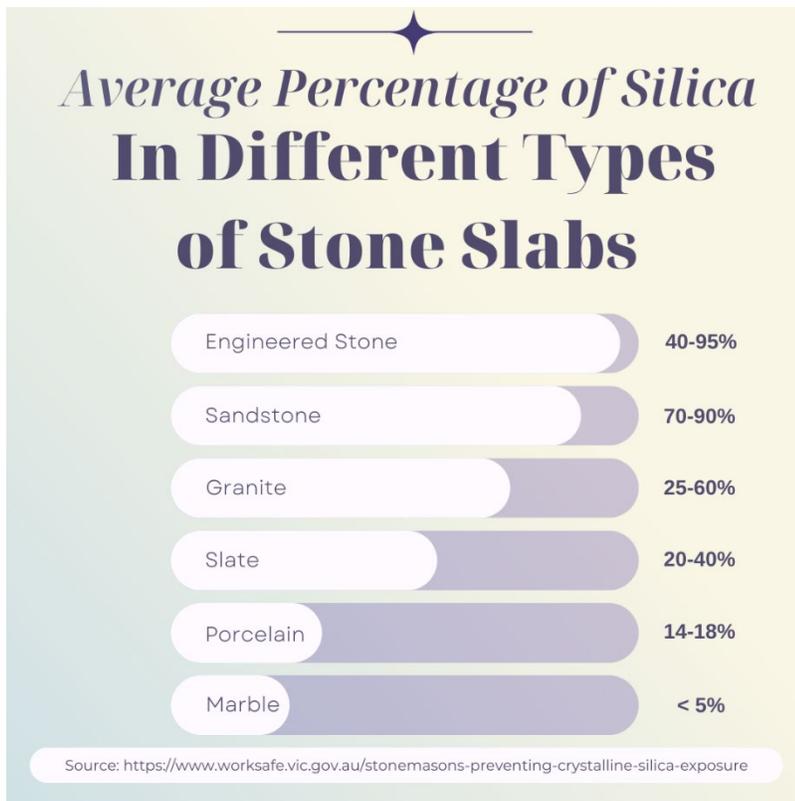
Thank you for watching lesson one of the Silica Exposure Training for the Cut Stone Industry., a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industry.

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Resources:

Image of Percentage of Silica in different types of stone:



Extension activity: Have participants look at safety data sheets for the various types of stone slabs at their place of work and compare how much silica is found in each slab.

Lesson Two: What you need to know about working with cut stone

This lesson goes over the outbreaks of silicosis that have been identified across the globe as a result of exposure to respirable crystalline silica exposure from the fabrication of engineered stone.

Script for Lesson	Image, Video or, Slide
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson two: What You Need to Know About Working with Cut Stone.</p>	
<p>In a 2020 survey of 2,014 homeowners seeking to remodel their kitchens, the number one countertop material of choice (as reported by forty percent of respondents) was quartz countertops made out of artificial or engineered stone (van Gelder, 2021). Engineered stone, or Quartz countertops, are marketed to consumers as durable, scratch-resistant surfaces that are less likely to stain and require no need to seal or reseal. Unlike natural stone, engineered stone provides consistency and uniformity, and the non-porous design makes it less prone to bacterial growth. Because the material is manufactured using primarily quartz rock, it is made out of abundantly available material, and because it is not entirely made of stone, it is lighter than natural stone products. What is more, once installed, the countertops can become a permanent, non-toxic fixture in the home.</p>	<p>Video walking around stone fabrication shop</p>

However, there is growing documentation of outbreaks of silicosis cases and other work-related conditions among employees involved with the manufacturing and fabrication of engineered stone countertops in Italy, Spain, Israel, Australia, the US, and China. These cases of silicosis are noteworthy not only because of the volume of cases, but silicosis cases are being diagnosed in much younger workers after shorter than usual exposure intervals compared to other industries with exposure to crystalline silica.



Like we covered in lesson one, engineered stone contains approximately 90% crystalline silica content, the basis of Quartz stone, bound together with a polymer resin, resulting in much higher exposure concentrations than those produced from natural stone. By contrast, granite contains only 30% silica content, and marble contains only 3% silica content.



Attention to the outbreak of this disease among countertop fabricators and manufacturers drew international attention after the Australian government in Queensland intervened and developed a screening program for all affected current and former employees in the industry after several researchers and physicians sounded the alarm and recommended the development of a health surveillance program to promote the early identification of disease among those who are asymptomatic. By 2021, 23% of workers screened in Queensland by WorkCover had been diagnosed with a work-related illness, with 206 of the 1053 individuals screened being diagnosed with silicosis. So this means that out of every 5 workers-one will suffer from an illness resulting from exposure to silica.



A 2019 [Morbidity and Mortality Weekly Report](#) published by the Centers for Disease Control and Prevention, highlighted an outbreak of silicosis cases among stone fabrication workers in the US. Public health professionals found 18 cases of severe silicosis and two deaths. Of these cases, 16 of the men are Hispanic and 2 are non-Hispanic African Americans. Several of these patients also had autoimmune diseases and latent tuberculosis infection. However, we do not know for certain how many cases may be out there but not having been

Silicosis: Engineered Stone

Silicosis	Workers are at risk	How to protect workers
<ul style="list-style-type: none"> Incurable lung disease Occurs after breathing silica dust 	<ul style="list-style-type: none"> 18 cases in 4 states 2 deaths Most worked with engineered stone 	<ul style="list-style-type: none"> Control and monitor exposures Comply with standards Conduct medical screening

United States:

- 18 cases of severe silicosis
- 2 deaths
- 16 Hispanic
- 2 non-Hispanic African Americans
- Additionally: autoimmune disease and latent TB infection; Reynauds (Israel)

"More cases will undoubtedly appear, since wherever this material is used it has caused disease..."

"The only reason the U.S. doesn't have many more cases is that no one has looked for them."

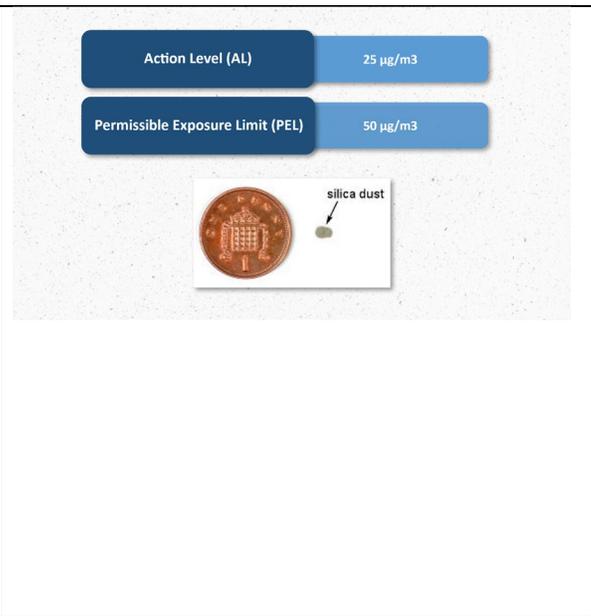
-Dr. David Michaels; 2009/2017 Asst Sec. of Labor OSHA
October Stat News Article

diagnosed because the US currently does not require that physicians report cases of silicosis.

Dr. David Michael was quoted as saying, “*More cases will undoubtedly appear, since wherever this material is used it has caused disease... The only reason the U.S. doesn't have many more cases is that no one has looked for them.*”

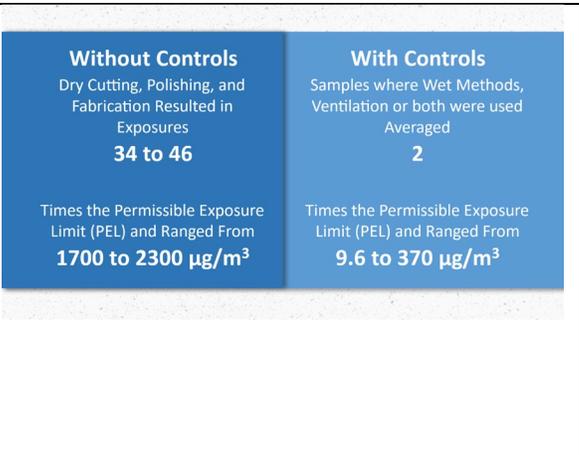
The OSHA standard for crystalline silica has two limits. The first limit is called the Action Level. This means that if employees are exposed to levels of silica dust that is 25 µg/m³ or higher, the employer needs to take action and implement medical surveillance for employees, provide training about silica, and develop an exposure control plan. The second level is called the Permissible exposure limit or PEL. This is the limit that is considered the highest level that employees should ever be exposed to during a full-shift. For silica, this limit is 50 µg/m³. To give you an example of what amount of silica dust we are talking about, take a look at this penny and then look at the small amount of silica dust next to the penny. This pile of silica dust represents the levels we are talking about- which is a very small amount.

From 2017-2021, consultants at the Georgia Tech OSHA consultation program have assisted eight different companies that fabricate cut stone for the countertop industry. A total of 10 visits were conducted where monitoring was conducted for employee exposure to silica dust, collecting a total of 46 full-shift samples at these sites. Employees were fabricating a wide range of countertops, including Engineered Stone or Quartz Countertops. For almost all shops, the type of stone being fabricated varied day to day based on orders. However, the average amount of silica that employees were exposed to averaged 227 µg/m³. This is 4.5 times the OSHA permissible exposure limit and over 9 times the Action level for silica.



When no controls were in place and employees were cutting, polishing or performing other types of fabrication dry, the exposures were 34 to 46 times the permissible exposure limit and ranged from 1700 to 2300 ug/m3.

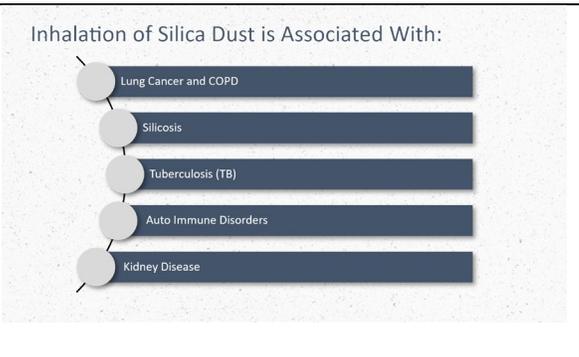
However, even when companies implemented some form of engineering control by either using wet methods, ventilation, or both wet methods and ventilation, the exposures were still 2 times the permissible exposure limit a ranged from 9.6 to 370 ug/m3.



In fact, 86% of all samples exceeded the OSHA Action level of 25 ug/m3 for silica. What this means, is that water and ventilation did NOT reduce exposures below the Action Level or PEL when fabricating countertops due to the high silica content in engineered stone (quartz) countertops.



What this means is that employees working in the cut stone industry, especially if they are fabricating engineered stone products, are potentially at increased risk for respiratory health illnesses, such as lung cancer, chronic obstructive pulmonary disease, and silicosis, infectious diseases such as tuberculosis, autoimmune disorders such as systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), and systemic sclerosis (SSc), and kidney disease.

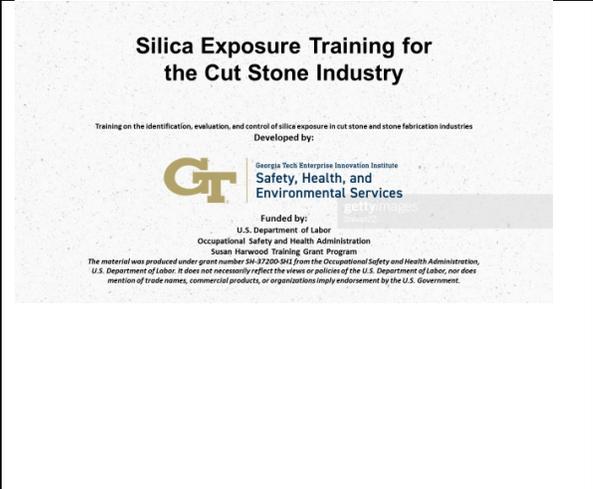


To prevent the development of these illnesses, employees fabricating stone that contains silica should receive hazard communication training for silica, be provided for and fitted for respiratory protection, be enrolled in a silica exposure medical surveillance program, and use tools fitted with water and ventilation to further reduce dust.



Thank you for watching lesson two of the Silica Exposure Training for the Cut Stone Industry., a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industry.

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Resources:

Blog post that links to the Morbidity and Mortality Weekly Report and other helpful resources: <https://blogs.cdc.gov/niosh-science-blog/2019/10/29/silicosis-countertop/>

On the following page is a handout to provide participants that goes over the exposure monitoring results and recommendations presented in this video.



Respirable Crystalline Silica Air Sampling Data From Cut Stone Industry in Georgia

86% of ALL samples exceeded the Action Level (AL) of 25 µg/m³

With Controls: Samples Where Wet Methods, Ventilation, or Both

were used averaged 2 times the Permissible Exposure Limit (PEL) and ranged from 9.6 to 370 µg/m³

Without Controls: Dry Cutting, Polishing, and Fabrication resulted

in exposures 34 to 46 times the Permissible Exposure Limit (PEL) and ranged from 1700-2300 µg/m³

Water and Ventilation Did NOT reduce exposures below the PEL

when fabricating Engineered Stone (Quartz) countertops due to the high silica content in this product.

8 Number of Companies Assisted

10 Number of Visits Conducted

46 Number of Full-Shift Samples

227 µg/m³ average silica for all samples

Employees Fabricating Stone that Contains Silica Should:

- Receive Hazard Communication Training for Silica
- Be provided and fitted for respiratory protection
- Be enrolled in a silica exposure medical surveillance program
- Use Tools fitted with Water and Ventilation to reduce dust

Inhalation of Respirable Crystalline Silica is Associated with:

- Lung Cancer and COPD
- Silicosis
- Tuberculosis (TB)
- Auto Immune Disorders
- Kidney Disease



Hear Ever's Story about being Diagnosed with Silicosis



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CONTACT US FOR MORE INFORMATION

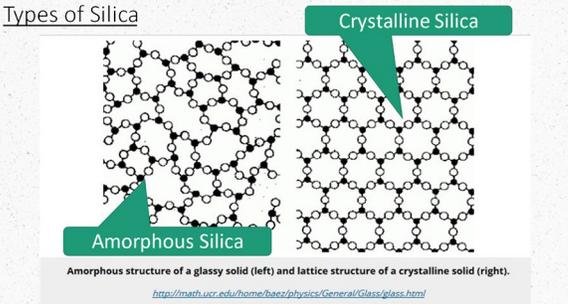
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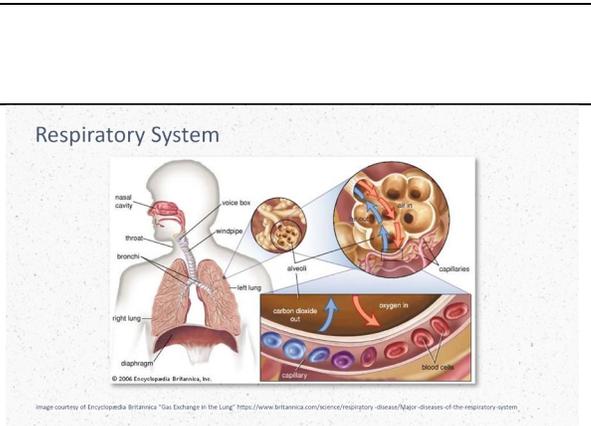
Lesson Three: Hazards of Exposure to Respirable Crystalline Silica

This lesson goes over the hazards of exposure to respirable crystalline silica.

Script for Lesson	Image, Video or, Slide
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<p>In this lesson we will be talking about how exposure to RESPIRABLE CRYSTALLINE SILICA (or RCS) can cause adverse health effects. There are actually two different types of silica: amorphous silica and crystalline silica. For the purpose of this training, when we refer to silica- we mean crystalline silica.</p> <p>Crystalline silica (if examined under a microscope) – has a lattice like-structure, which gives it the prismatic effect, and distinguishes it as a hard mineral, where amorphous silica (an example is glass) doesn’t have this symmetrical structure. Crystalline silica has three main forms: quartz, tridymite, and cristobalite. For work with engineered stone, we are going to focus on quartz crystalline silica.</p>	
<p>Crystalline silica is a common mineral. It can be found everywhere. It is in sand and part of the earth’s crust. However, when silica is crushed down to a very small size, which is something that happens when you cut, grind, or polish engineered stone countertops, the silica is able to enter in to the deepest parts of the lung.</p> <p>The silica dust particles produced are what we call respirable and are approximately 100 times smaller than ordinary sand. To give you a perspective, let’s take a look at this training video OSHA made back in</p>	<p>Clip of Stop Silicosis video</p>

1938 that demonstrates just how small respirable crystalline silica particles are....

If the dust particles are small enough, they can make it all the way to the alveoli of the lungs. There are 300 million alveoli in the lung, and this is the site of gas exchange. There are immune defense cells called macrophages that “patrol” the surface of the alveoli looking for foreign invaders such as (dust, virus, or bacteria), and when they encounter a foreign particle they engulf it or eat it. In the case of silica dust, they try to dissolve it, but the mineral does not dissolve – it persists (aka biopersistence) – and when the macrophage dies, it creates scar tissue. Chronic exposure to silica leads to chronic inflammation and perpetuation of the cycle and develops fibrotic nodules and scarring around the trapped silica particles. The fibrotic condition of the lung is called silicosis. If the nodules grow too large, breathing becomes difficult and death may occur. Silicosis development is dependent on the size of the silica particles, the exposure concentration and the duration of exposure.



There are actually three main health effects associated with exposure to silica: lung system effects, kidney or renal system effects, and immune system effects.

Let’s go over each of these main health effects.

Main Health Effects

Lung Effects
Kidney (Renal) Effects
Immune System Effects

The first health effect associate with exposure to silica is lung disease. And the main lung disease is called silicosis. What scientists are observing with workers in the cut stone industry is the exposure to silica dust from the fabrication of engineered stone is actually resulting in rapidly developing or *accelerated* cases of silicosis. The symptoms of accelerated silicosis include severe shortness of breath, weakness, cough, weight loss, fever, fatigue, coughing up blood, and chest pain.

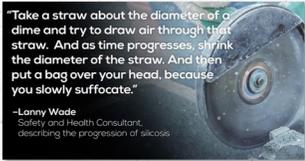
Silicosis is not a reversible condition, and there is no specific treatment for the disease, other than administration of drugs to alleviate inflammation and

Lung Disease: Silicosis

Symptoms of Accelerated Silicosis:

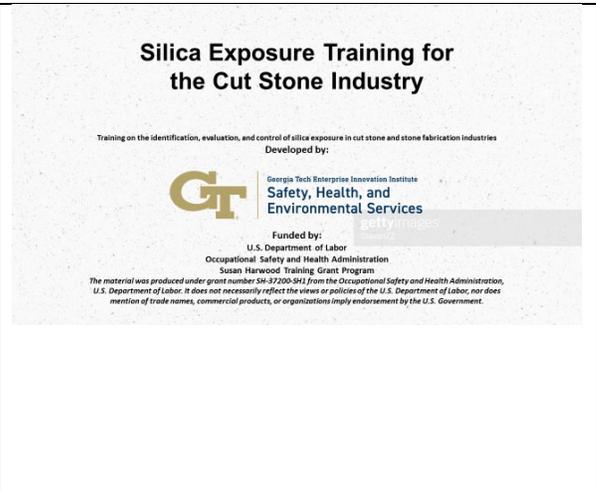
- o severe shortness of breath
- o weakness
- o cough
- o weight loss
- o fever
- o fatigue
- o coughing up blood
- o chest pain

Case courtesy of Assoc Prof Frank Gaffard, Radiopaedia.org. ID: 12155

<p>maintain open airways, or administration of oxygen therapy in severe cases.</p> <p>The diagnosis of silicosis is based on a history of exposure to respirable crystalline silica, chest x-ray, and the exclusion of other conditions that appear similar.</p>	
<p>Let's hear from Ever on how silicosis feels for him</p>	<p>Clip of Ever</p>
<p>Having exposure to silica increases the risk of other problems, such as tuberculosis, lung cancer, and chronic obstructive pulmonary disease.</p> <p>There are some studies showing that risk of lung cancer increases if silica-exposed worker is also a smoker.</p> <p>And if the lungs are overwhelmed with silica particles, the macrophages that normally fight off disease may not be able to handle exposure to tuberculosis bacteria. As a result, exposure to silica increases the risk of contracting tuberculosis. And, if a person has latent tuberculosis and they are exposed to silica, the likelihood of that infection becoming active increases.</p>	<p>Lung Disease</p>  <p>"Take a straw about the diameter of a dime and try to draw air through that straw. And as time progresses, shrink the diameter of the straw. And then put a bag over your head, because you slowly suffocate."</p> <p>-Lanny Wade Safety and Health Consultant, describing the progression of silicosis</p> <ul style="list-style-type: none"> ○ Lung Cancer <ul style="list-style-type: none"> • known human carcinogen ○ COPD <ul style="list-style-type: none"> • i.e. bronchitis and emphysema ○ Tuberculosis (TB)
<p>Silica is slightly soluble in blood, which is how it can end up in the kidneys. For this reason, workers exposed to silica may be twice as likely to suffer kidney or renal disease.</p>	<p>Kidney (Renal) Disease</p> 
<p>Finally, workers who become sick with silicosis can also develop immune system disorders such as scleroderma, rheumatoid arthritis, or lupus. Scleroderma is associated with skin discoloration and ulceration; joint pain; swelling and discomfort in the extremities; breathing problems; and digestive problems. Rheumatoid Arthritis is associated with joint pain and tenderness; fatigue; fever; and weight loss. And lupus, a chronic disease of connective tissue has a wide range of symptoms, including: skin rash; fever; fatigue; joint pain; anemia; and iron deficiency.</p>	<p>Immune System Disorders</p> <ul style="list-style-type: none"> ○ Scleroderma ○ Rheumatoid Arthritis ○ Systemic Lupus Erythematosus 

Thank you for watching lesson three of the Silica Exposure Training for the Cut Stone Industry, a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industry.

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Resources:

Health Effects Training from Work Safe BC Silica:

- <https://www.youtube.com/watch?v=qBgwDvjs5Zc>

History and health effects of exposure to silica from the Department of Labor in 1938, titled Stop Silicosis:

- <https://www.youtube.com/watch?v=pHwvKKQ5WtI&t=26s>

Case Studies:

- **Case Study: Terry the former stoneworker suffering with silicosis**
<https://www.youtube.com/watch?v=mHacjn4qjoQ>
- **"Stop Silicosis" (2016) – Tom Ward's story**
<https://www.youtube.com/watch?v=HAByllzQSuU>

Questions to ask the class (source: OSHA 7151 Course):

1. The most common symptom of excessive respirable crystalline silica exposure is:
 - a) Cancer
 - b) Shortness of breath**
 - c) Tuberculosis

d) Liver disease

2. Workers suffering from silicosis have _____ lung capacity.

a) Decreased

b) Increased

c) Unchanged

d) Interrupted

3. This is another name for the scarring that occurs in the lungs of workers diagnosed with silicosis:

a) Pneumoconiosis

b) Bronchitis

c) Fibrosis

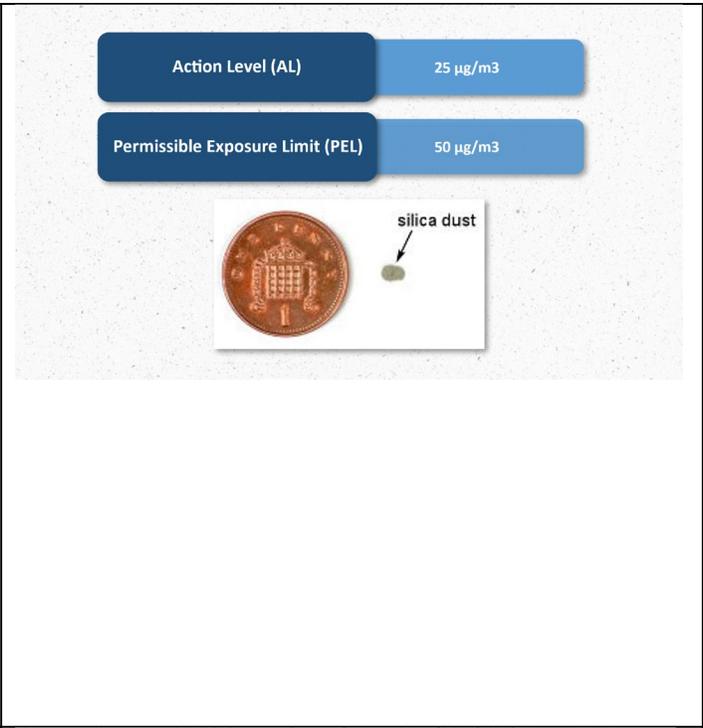
d) Cancer

Lesson Four: The OSHA Silica Standard for General Industry

This lesson goes over the requirements of the OSHA Respirable Crystalline Silica standard for general industry, 29 CFR 1910.1053.

Script for Lesson	Image, Video or, Slide
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson four: The OSHA Silica Standard for General Industry.</p>	<div data-bbox="781 520 1068 884"> <p>Lesson Four:</p> <p>The OSHA Silica Standard for General Industry</p> </div> 
<p>Understanding what the requirements if you are in charge of handling compliance with the silica standard can be daunting. There are several regulatory standard that are applicable with relation to documenting compliance. Parts of the puzzle include: determining what the exposures are for employees to silica by performing exposure assessment, figuring out if respiratory protection is required, enrolling employees exposed to silica dust above the action level in medical surveillance, performing hazard communication training based on the safety data sheets and exposures for employees, and developing a written exposure control plan.</p>	<div data-bbox="781 976 1450 1346"> <p>Putting the Pieces Together</p>  </div>
<p>Whew! That may seem like a lot, but let’s break it down. Let’s review the general industry OSHA silica standard 29 CFR 1910.1053</p>	<div data-bbox="781 1554 1450 1923"> <p>OSHA’s Crystalline Silica Standard: <u>General Industry</u> 29 CFR 1910.1053</p>  </div>

The OSHA standard for crystalline silica has two limits. The first limit is called the Action Level. This means that if employees are exposed to levels of silica dust that are 25 $\mu\text{g}/\text{m}^3$ or higher, the employer needs to take action and implement medical surveillance for employees, provide training about silica, and develop an exposure control plan. The second level is called the Permissible exposure limit. This is the limit that is considered the highest level that employees should ever be exposed to during a full-shift. For silica, this limit is 50 $\mu\text{g}/\text{m}^3$. To give you an example of what amount of silica dust we are talking about, take a look at this penny and then look at the small amount of silica dust next to the penny. This pile of silica dust represents the levels we are talking about- which is a very small amount.



Under the silica standard employers must meet certain requirements. Employers must determine employee exposure to RCS, determine regulated areas and also create a written exposure control plan for their facility.



Employers are also responsible for implementing a respiratory protection program (if necessary), provide employees with medical surveillance and provide employees with training related the hazards associated with RCS exposure.



The first step towards gaining compliance with the silica standard is to conduct exposure monitoring. There are two options for determining the exposure, one is called the performance option where you look at a combination of air monitoring data that was collected and make a judgement about exposure or you can do what we call perform scheduled monitoring or representative sampling, which is where you conduct air sampling for the employees at the facility to see their exposures. This is actually the best method for cut stone companies because each company processes such a wide variety of types of stone, they have very different buildings and ventilation where the fabrication takes place, and use different tools. For these three reasons, using someone else's data may not actually represent the levels of silica in the air at your facility.

Depending on the results, if silica is measured to be below the all OSHA limits for silica, then no further testing is required. If the results are between the Action Level and the Permissible Exposure limit, the company will need to retest every six months. And if the results are above the Permissible exposure limit, the company has to perform silica sampling every three months.

First let's take a look at what silica sampling looks like then we will look at some objective data that could be used for the performance option.

In this video, an industrial hygienist, which is a scientist that assesses employee exposure to hazards, is explaining to a polisher that she will be performing air sampling to determine his exposure to silica. To monitor for silica, you use a pump, which works like a vacuum cleaner to pull air into this device we call a cyclone. The cyclone spins the air around so only the smallest particles that can get into your lungs land on the filter. Then at the end of the day, that filter will be sent to a lab that will measure what landed on the filter. After

Options for Conducting an Exposure Assessment

o Performance Option

o Scheduled Monitoring Option



Video showing personal exposure monitoring (slides 8-10 of ppt)

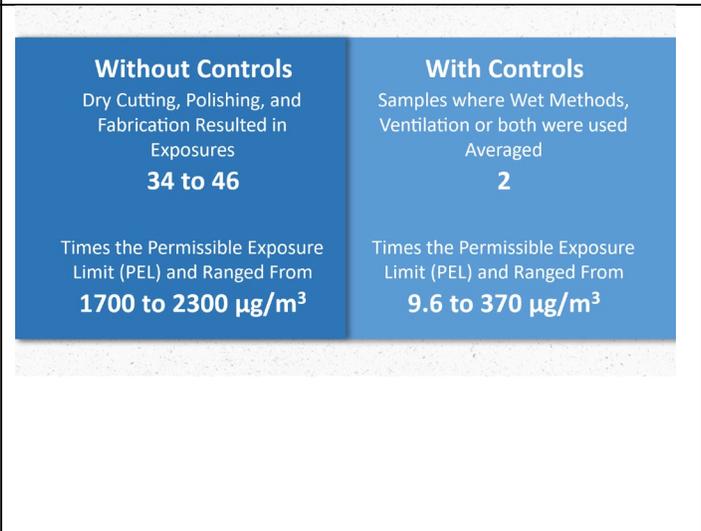
the lab analyzes the filer, they will send the company the results which will help them determine if they need to implement additional engineering controls or if employees need to wear respiratory protection.

Now, let's review some objective data that consultants at the Georgia Tech OSHA consultation program collected from 2017-2021. We reviewed this information during lesson two, but now let's look at it from the perspective of complying with the OSHA silica standard. During this time they assisted eight different companies that fabricate cut stone for the countertop industry. A total of 10 visits were conducted where monitoring was conducted for employee exposure to silica dust, collecting a total of 46 full-shift samples at these sites. Employees were fabricating a wide range of countertops, including Engineered Stone or Quartz Countertops. For almost all shops, the type of stone being fabricated varied day to day based on orders. However, the average amount of silica that employees were exposed to averaged 227 ug/m3. This is 4.5 times the OSHA permissible exposure limit and over 9 times the Action level for silica.



When no controls were in place and employees were cutting, polishing or other performing other types of fabrication dry, the exposures were 34 to 46 times the permissible exposure limit and ranged from 1700 to 2300 ug/m3.

However, even when companies implemented some form of engineering controls by either using wet methods, ventilation, or both wet methods and ventilation, the exposures were still 2 times the permissible exposure limit and ranged from 9.6 to 370 ug/m3.



In fact, 86% of all samples exceeded the OSHA Action level of 25 ug/m³ for silica. What this means, is that water and ventilation alone did NOT reduce exposures below the Action Level or Permissible Exposure Limit when countertops were being fabricated due to the high silica content in engineered stone or quartz countertops.



86% Of All Samples Exceeded the Action Level (AL) of 25 µg/m³

Water and Ventilation did NOT reduce exposures below the PEL when fabricating Engineered Stone (Quartz) countertops due to the high silica content in this product.

Technically, respiratory protection is required if measured exposures to silica are greater than the OSHA permissible exposure limit even after engineering and work practice controls are installed; and if exposures are greater than the permissible exposure limit during maintenance and repair tasks where engineering and work practice controls aren't feasible; when all controls are implemented and exposures STILL aren't less than the permissible exposure limit; or while employees are in a regulated area. That said, based on the data we just shared, if engineered stone is being processed, we recommend employees be provided with at least an N-95 respirator. In these photos, you see that one employees is wearing a ½ mask elastomeric respirator with combination cartridges to protect for dusts and chemicals. In the second picture, the employee is wearing an N-95 respirator, but has not securely places the lower strap behind his neck yet.

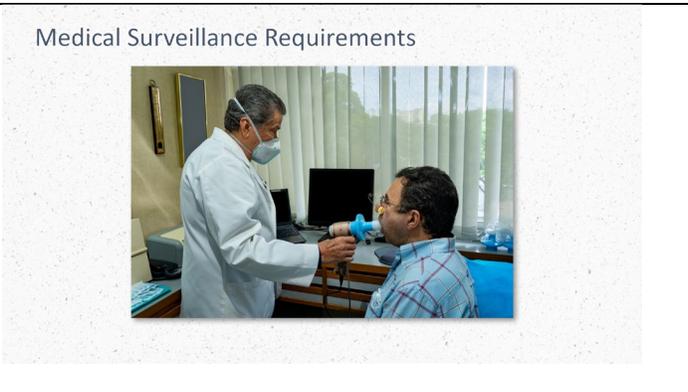
When is Respiratory Protection Required?



Exposure monitoring results are also used to determine which areas in the facility will be designated as regulated ones. Before entering these areas, there should be signs to alert employees about the exposure hazards and prompt employees to wear the appropriate respiratory protection. The sign must state: Danger, Respirable Crystalline Silica, may cause cancer, causes damage to the lungs, wear respiratory protection in this area, authorized personnel only.



Medical surveillance is required when employees are exposed to respirable crystalline silica for 30 days or more a year above the action level. The initial or baseline exam must be made available within 30 days of initial assignment, unless the employee has received an equivalent medical exam within the past 3 years AND THEN Periodic examinations must be made available at least every 3 years.



The employer must not allow dry sweeping, dry brushing, and no use of compressed air (unless that compressed air is used in conjunction with a ventilation system) or there is absolutely no other method available. Wet sweeping and the use of HEPA-filtered vacuum systems are the main ways to manage the dust.

Video clip of housekeeping being performed in fabrication shop

To make sure employees are aware of all these aspects of the silica standard, there are two main ways the employer has to communicate this information. The first is by developing a written exposure control plan and the second is by conducting training. The written exposure control plan is similar to a job hazard analysis in that the employer is required to describe every task where employees are exposed to silica dust. Then after describing the task, the employer must list the controls that were implemented to reduce exposure to silica dust, this might include engineering controls, work practice controls, and respiratory protection. Then, the employer will explain how employees can safely perform housekeeping and prevent employees not authorized from entering the work area and walking through the production floor. We recommend checking out the OSHA Small Entity Compliance Guide for instructions on creating the written exposure control plan, found on the OSHA website at osha.gov. It includes a helpful sample document. Or, check out the silica safe website, where they have a create-a-plan tool that walks you through the process.

Written Exposure Control Plan

- o Description of Task
- o Control Description
- o Housekeeping
- o Procedures Used to Restrict Access to Work Areas
- o Osha.gov
- o <https://plan.silica-safe.org/>



One of the most important part about the silica standard is the requirement to provide hazard communication training to employees to let them know the hazards of working with silica. Let's hear from Ever to find out what kind of training he had received.

Clip of Ever talking about training

From Ever's video, you can understand how angry he became after finding out after years of being exposed to silica that it was dangerous. Employees may even be at significant risk even if they are not exposed to "high levels" of respirable crystalline silica. Employers are required to provide training on the hazards associated with exposure to respirable crystalline silica as part of the hazard communication program. The employer must also provide labels on containers and slabs of stone of crystalline silica, maintain a copy of safety data sheets, and train employees about the silica standard and the potential health effects, which include: Cancer, lung effects, immune system effects, and kidney effects.

Hazard Communication of Silica Exposure

Health Hazards:

- Cancer
- Lung Effects
- Immune System Effects
- Kidney Effects



Finally, let's talk recordkeeping. To comply with the silica standard: Fit test records for respiratory protection must be maintained until next test or one year. Exposure records or air sampling results must be saved for 30 years with detailed information about who was sampled, what tools they were using, the conditions of the work environment the day the sampling was performed, and the materials being processed. And finally medical evaluation and respiratory protection) and surveillance records for silica sampling must be retained for at least the duration of employment plus thirty years.

These records also must be made available to the employee or to his or her designated representative.

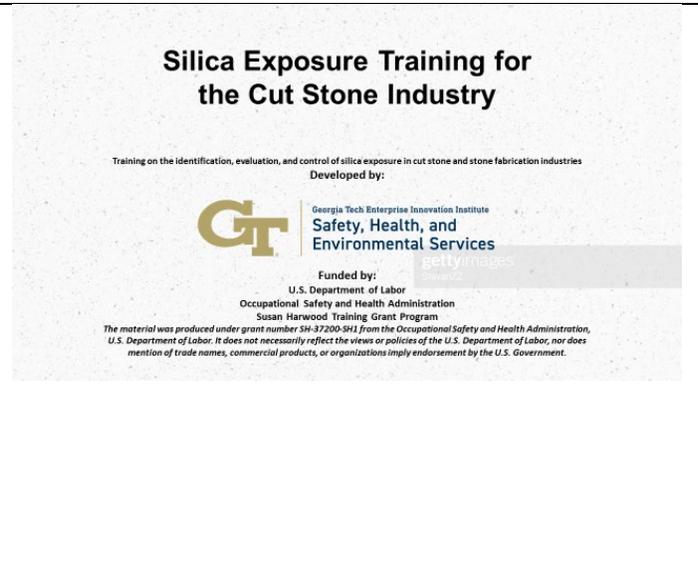
Records Retention for Documents



- Records must be made available to the employee or their designated representative

Thank you for watching lesson four of the Silica Exposure Training for the Cut Stone Industry., a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industry.

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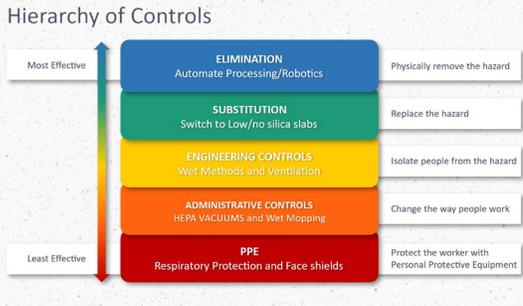
Resources:

Silica Safe create a plan: <https://plan.silica-safe.org/> .

OSHA's Silica Standard website: <https://www.osha.gov/silica-crystalline>.

Lesson Five: Engineering Controls for Task Specific Exposures

This lesson goes over engineering controls to help lower silica exposure for different tasks in the stone fabrication industry.

Script for Lesson	Image, Video or, Slide
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson Five: engineering controls for task specific exposures.</p>	
<p>Reducing employee exposure to silica dust requires implementing several measures from what we, as safety and health professionals, call the hierarchy of controls. The most effective method to reduce exposure to silica dust would be to fully automate the process with robotics, which would eliminate employee exposure. Employers could also reduce employee exposure by only fabricating slabs of stone and engineered stone that have low to no silica content. This means the employer would need to review safety data sheets for products prior to marketing these types of countertops to the customer.</p> <p>In this lesson, we are going to focus on the next level of the hierarchy of controls: engineering controls. For stone fabrication, the two main forms of engineering controls are wet methods and the use of ventilation. OSHA requires employers to investigate engineering controls whenever exposures potentially exceed OSHA Action Levels or Permissible Exposure limits for silica. Respiratory protection and other forms of PPE are not considered an engineering control and are considered the last line of defense to protect employees from silica.</p>	 <p>The diagram illustrates the Hierarchy of Controls, a vertical stack of five colored boxes representing different control strategies, ordered from most effective at the top to least effective at the bottom. A vertical arrow on the left side of the stack points upwards, indicating the direction of increasing effectiveness.</p> <ul style="list-style-type: none"> ELIMINATION (Blue): Automate Processing/Robotics. Physically remove the hazard. SUBSTITUTION (Green): Switch to Low/no silica slabs. Replace the hazard. ENGINEERING CONTROLS (Yellow): Wet Methods and Ventilation. Isolate people from the hazard. ADMINISTRATIVE CONTROLS (Orange): HEPA VACUUMS and Wet Mopping. Change the way people work. PPE (Red): Respiratory Protection and Face shields. Protect the worker with Personal Protective Equipment.

Investigating engineering controls is so important because as we stated in lesson 2, when we have conducted sampling for companies fabricating engineered stone, when no controls were in place and employees were cutting, polishing or other performing other types of fabrication dry, the exposures were 34 to 46 times the permissible exposure limit and ranged from 1700 to 2300 ug/m3.



Video of employees polishing (slides 3 & 4 of ppt)

First, let's talk about wet methods. The purpose of using wet methods is to control dust by applying water at the dust generating site. This method, for fabricators, typically means purchasing tools that are fully integrated with a wet method configuration. Adequate dust capture (by water) is dependent on a variety of factors – particle size, velocity, spray nozzle size and location, and environmental factors such as water hardness, humidity, and weather. Water flow rates are not applicable to all types of equipment so make sure to consult the manufacturers recommendations and assess whether there is visible spray from the operation of tools.



Video of CNC machine (slide 5 of ppt)

Even with ample amounts of water, employees may be exposed to fine droplets of water that have silica dust particles in them. In this video, you can see the silica dust that has settled on the outside of the cartridge of the employee's respirator, even though he is using wet methods.



After implementing a wet control method, such as shown in these videos where you see the use of a water jet attachment to the CNC machine to cut slabs, each employer should check the operation site to determine if the control method adequately reduces exposure. To do this, the employer can watch for visible dust and conduct air sampling to quantify employee exposure to silica. The benefit of using a CNC machine to perform much of cutting is that



employees do not need to stand in the vicinity during fabrication.

The second form of engineering controls used in stone fabrication are dust collection systems or ventilation systems. Employers must make sure that dust collection systems are appropriately designed for the tool being used and will be effective in capturing the dust generated from the tool/task without introducing an additional safety hazard. Today, there are lots of options for fully integrated dust control ventilation systems that are commercially available on the market. If an older system is retrofitted with a shroud to provide dust collection, it is imperative that the system not also introduce a safety hazard. In this photo, employees at a shop attached a broom handle to an orbital saw and then attached a HEPA vacuum to remove the dust. Unfortunately, when they did this, they also removed the guard that would have protected employees from getting cut.

One factor to consider when grinding and polishing stone surfaces is that the sanding discs come in a wide variety of sizes, grits, and holes for dust control. The number of holes in the discs will vary based on if it is water delivery system or a dust ventilation or vacuum system. You can see that all of these discs have one hole, this is because the company uses a specific type of water delivery system with one water source. If you are using a vacuum type system for a sander or polisher, the more holes – the better the dust capture. Just keep in mind, the higher the grit the finer the abrasive the finer the dust that may be getting into the air.

Finally, our recommendation is that all employers, even if they are using wet methods, ventilation, or both wet methods and ventilation, should perform air sampling to determine the true employee exposure to silica when fabricating engineered stone countertops. With the silica content being so high for engineered stone countertops and since the quartz used to create the countertops was already crushed once meaning that the quartz breaks into even finer particles when employees grind, polish, or cut the stone, the potential for employees to be exposed to silica above the OSHA Action Level or Permissible Exposure limit is much greater. As we stated during an earlier

Video of CNC (slides 7 & 8 of ppt)

Dust Collection Systems

- Must be appropriately designed
- Many options for fully integrated systems on the market
- Make sure any improvised systems do not introduce Safety Hazards



Video of different polishing pads



<p>lesson, from data collected by the Georgia Tech OSHA Consultation program, even when companies implemented some form of engineering control by either using wet methods, ventilation, or both wet methods and ventilation, the exposures were still 2 times the permissible exposure limit an ranged from 9.6 to 370 ug/m3.</p>	
<p>To prevent the development of these illnesses, employees fabricating stone that contains silica should receive hazard communication training for silica, be provided for and fitted for respiratory protection, be enrolled in a silica exposure medical surveillance program, and use tools fitted with water and ventilation to further reduce dust.</p>	<p>Takeaways: All Employees Working With Fabricated Stone</p> <ul style="list-style-type: none"> ● Receive Hazard Communication Training For Silica ● Be Provided and Fitted for Respiratory Protection ● Be Enrolled in a Silica Exposure Medical Surveillance Program ● Use Tools Fitted with Water and/or Ventilation to Reduce Dust
<p>Thank you for watching lesson five of the Silica Exposure Training for the Cut Stone Industry., a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industry.</p> <p>This material was produced under grant number SH-37200-SH1 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.</p>	<p style="text-align: center;">Silica Exposure Training for the Cut Stone Industry</p> <p style="text-align: center;"><small>Training on the identification, evaluation, and control of silica exposure in cut stone and stone fabrication industries</small></p> <p style="text-align: center;"><small>Developed by:</small></p> <div style="text-align: center;">  <p style="font-size: small;">Georgia Tech Enterprise Innovation Institute Safety, Health, and Environmental Services</p> </div> <p style="text-align: center;"><small>Funded by:</small></p> <p style="text-align: center; font-size: x-small;">U.S. Department of Labor Occupational Safety and Health Administration Susan Harwood Training Grant Program</p> <p style="text-align: center; font-size: x-small;"><i>The material was produced under grant number SH-37200-SH1 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.</i></p>

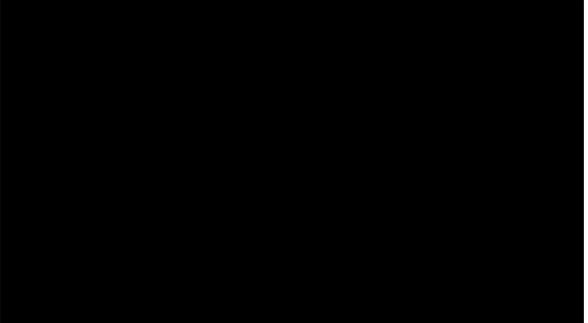
Resources:

Center for Disease Control and Prevention’s Website for Silica Engineering controls:
<https://www.cdc.gov/niosh/topics/silica/controls.html> .

Australia’s Worksafe Victoria’s Guide for Stonemason’s to Prevent Silica Exposure:
<https://www.worksafe.vic.gov.au/stonemasons-preventing-crystalline-silica-exposure>

Lesson Six: Personal Protective Equipment and Respiratory Protection for the Cut Stone Industry

This lesson goes over personal protective equipment and respiratory protection requirements while working with respirable crystalline silica.

Script for Lesson	Image, Video or, Slide
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson Six: Personal Protective Equipment and Respiratory Protection for the cut stone industry.</p>	
<p>Before we dive into a lesson on personal protective equipment and respiratory protection, let’s hear from Ever about his experience with respirators and masks.</p>	 <p>--Video of Ever discussing the use of masks in his facility</p>
<p>So How do you know what type of personal protective equipment or PPE you should wear when working in the cut stone industry? Your employer is required to perform a personal protective equipment hazard assessment that looks at each job at the facility and identifies what hazards may cause injury or illness. Once this task is completed, your employer uses this information to select the appropriate PPE for you to wear.</p>	

This is an example of a PPE Hazard Assessment for employees that are performing polishing and sanding at the fabrication shop. If we look at the job of polishing and sanding, some of the hazards an employee might experience include:

- Noise from tools
- Silica Dust from polishing and sanding
- Slips, Trips, and Falls from Water on the Floor and injuries to feet from dropping objects
- Water on clothing
- Injury to arms/ hands from polishing and sanding
- Dust and flying debris

So as a result, the personal protective equipment we might select for this job would include: Hearing Protection, Respiratory Protection, Steel toed boots that are slip resistant and rubber, an Apron, Arm Sleeves, gloves, and Safety Glasses.

Now let's watch as Javier dons his personal protective equipment. He is already wearing his rubber, slip-resistant, steel toe boots. First he puts on nitrile gloves to protect his hands from the water and dust. Next, he secures the arm sleeves to protect the length of his arms. After that, he puts on his respirator and safety glasses. Finally he puts on his apron to keep himself dry. Notice how before he gets to work, he performs a user seal check to make sure the respirator is seated properly on his face.

We just watched Javier don his PPE, but he was missing one important piece of equipment. Instead of wearing hearing protection, he had a Bluetooth headset in his ear. This is a common problem, and let's show you why.

PPE Hazard Assessment

JOB	HAZARDS	PPE REQUIRED
<ul style="list-style-type: none"> • Polishing • Sanding 	<ul style="list-style-type: none"> • Noise from tools • Silica Dust from polishing and sanding • Slips, Trips, and Falls from Water on the Floor and injuries to feet from dropping objects • Water on clothing • Injury to arms/ hands from polishing and sanding • Dust and flying debris 	<ul style="list-style-type: none"> • Hearing Protection • Respiratory Protection • Steel toe, slip resistant boots • Apron • Arm Sleeves and gloves • Safety Glasses



Video of Javier Donning his required PPE

PPE Hazard Assessment



In this video, we are using a sound level meter to measure how loud it is when employees perform grinding, sanding, and polishing on stone countertops. Work related hearing loss can occur when an employee is exposed to noise above 85 dBA over the course of an 8-hour work shift, and OSHA requires that hearing protection be worn when noise is above 90 dBA for an 8-hour work shift. For this task, the noise levels reach 99 dBA, and they consistently hovered well over 95 dBA. What this means is that if you are wearing a Bluetooth ear piece or some other form of device to listen to music while you work, not only are your ears being exposed to the noise from the tools, but they are also being exposed to the sound waves from the music you are listening too. And all too often, we discover that employees turn the music up higher than the noise from the tools to be able to hear the music, meaning in this case, the employee might be listening to music above 100 dBA. At 100 dBA, it will only take 15 minutes to reach 100% of a person's total amount of noise they can be exposed to during a day or dose before causing permanent damage to their ears.



Video showing the noise exposure while employees are performing fabrication tasks.

There are several different types of respirators or masks that can be used to protect you from silica dust. Your employer should first conduct air sampling to determine how much silica dust is in the air. Using those results, your employer may select either a “dust mask” or N-95 respirator, which is also called a particulate filtering face piece. This type of respirator should only be used once and thrown out at the end of the day. Or, your employer may select a respirator that either covers half the face and has cartridges attached- which is called a half mask elastomeric respirator or any number of other types of respirators, some of which also provide eye protection. Half mask respirators and N-95 dust masks are both negative pressure and tight-fitting, which means which means the following things must happen:

1. Your employer should either provide you with what is called Appendix C of the respiratory protection standard, which is like a survey you fill out to see if you are healthy

Air Purifying Respirators

1. Employer should provide Appendix C of the respiratory protection standard, or send you to a healthcare provider
2. Fit Tested
3. Clean shaven

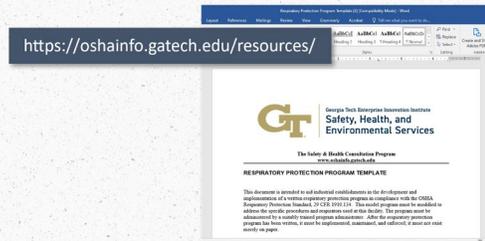


enough to wear a respirator or send you to a healthcare provided to check your lungs.

2. You should be fit tested, which is a test that is performed to make sure that the respirator fits well enough so that no silica dust gets into your lungs.
3. You need to be clean shaven. Facial hair prevents respirators from keeping the silica dust out.

When employees are required to wear respirators, employers must comply with all the elements of a respiratory protection program. Employers are responsible designating a program administrator who must ensure that the appropriate respirator is selected, employees have been medically evaluated (before being allowed to wear a respirator), employees have been fit tested, employees have been trained about the maintenance/care and use of the respirator, and that they annually evaluate the program. To help companies develop a respiratory protection program, we have downloadable sample written programs on our website at oshainfo.gatech.edu/resources/.

Air Purifying Respirators



If your employer requires you to wear a respirator, you should be provided with a medical evaluation. This is different than the silica medical surveillance, which we will talk about in another lesson. Here are some important things to know about the respiratory protection medical evaluation:

1. The employer has to provide this at no cost to the employee, it must be kept confidential, and provided during the employee's normal working hours or at a time and place convenient to the employee.
2. The medical questionnaire needs to be provided in a way that the employee understands. The employer should give the employee an opportunity to discuss the questionnaire and examination results. This should be provided in a language the employee understands.

Medical Evaluation for Respirator Use

Medical Evaluation must be provided:

- o Before fit testing and allowing use of respirator
 - o If conditions change
- o Provided at NO COST to the employee



<p>Medical evaluations are not required when N-95s are voluntarily used.</p>	
<p>The employer must provide the physician or licensed health care professional (PLHCP) with: A copy of the silica standard, the description of the anticipated <i>duties</i> as they relate to silica exposure, the former, current, and anticipated <i>levels of exposure</i> to silica for each employee, personal protective equipment used by employee, and all previous medical examinations in control of the employer. This is to help the physician or licensed health care professional to understand what physical activity or tasks employees have to do as part of their jobs so that the licensed healthcare provider can determine if the employee’s body can handle wearing a respirator for the entire work shift.</p>	<p>Medical Evaluation for Respirator Use</p> <p>Provide the PLHCP with a copy of:</p> <ul style="list-style-type: none"> ○ OSHA’s respiratory protection standard [1910.134 (e)] ○ Your company’s respiratory protection program ○ the type and weight of the respirator to be used by the employee ○ the duration and frequency of use ○ the expected physical work effort ○ additional protective clothing and equipment ○ temperature and humidity extremes that may be encountered
<p>Employees who have been medically cleared to wear a respirator by the physician or licensed health care provider can now be fit tested using the type of respirator they will be working with. Employees must be fit tested prior to the initial use of the respirator and then annually after that. Fit testing must also occur whenever a different type of respirator is being used, when the physical appearance of an employee changes, or when an employee indicates that the current fit of the respirator is poor.</p> <p>What this means for you, is that if you notice dust getting in the respirator, you need to let your employer know so they can help you find a respirator that fits properly and will protect you.</p>	<p>Fit Testing</p> <p>Fit Tests must be performed:</p> <ul style="list-style-type: none"> ○ Prior to initial use ○ Whenever a different face piece is used ○ Annually ○ When changes in an employee’s physical condition occur ○ Employee indicates that fit is poor 
<p>One way to make sure your respirator fits properly, is to perform a user seal check every time you put the respirator on. To do this, put the respirator on, cover the part of the respirator that allows air to get out- called the exhalation valve (or the entire mask if it is an N-95 respirator). Then try to breathe out- If you feel air leaking out, then you need to adjust the respirator. Then, cover the part of the mask where the air comes in – called the inhalation valves (or for the entire mask if it is an N-95). Now- breathe in. The mask should get tighter on your face, but if you feel air leaking in, then again you need to adjust the respirator.</p>	

Respiratory protection training must be provided annually to employees who are a part of the respiratory protection program. Training should include:

- Procedures for selecting appropriate respirators
- Medical evaluations for respirator users
- Fit-test procedures for tight fitting respirators
- Procedures for proper routine and/or emergency use respirators
- Cleaning, storing, inspecting, repairing, & maintenance of respirators
- Ensure adequate quality, quantity, and flow of breathing air
- Respiratory hazards to which employees are exposed
- How to wear, use, and care for their respirators

Respirator Protection Training

Address:

- Procedures for selecting appropriate respirators
- Medical evaluations for respirator users
- Fit-test procedures for tight fitting respirators
- Procedures for proper routine and/or emergency use respirators
- Cleaning, storing, inspecting, repairing, & maintenance
- Ensure adequate quality, quantity, and flow of breathing air
- Respiratory hazards to which employees are exposed
- How to wear, use, and care for their respirators

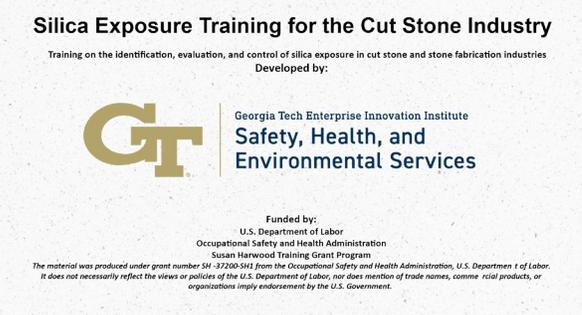
One of the problems we see when we inspect countertop fabrication facilities, is that respiratory protection is not maintained and cared for properly. In this image, you can see a half-mask elastomeric respirator hanging off a cart. This is a problem because it will ruin the elastic on the straps, preventing a secure fit, and it leave the inside of the mask exposed to any silica dust that is in the air that may settle inside the mask. What this means, is when the employee puts that mask on, they may immediately breathe in any dust that settled in the mask. This is why proper maintenance and care is so important to prevent exposure to silica dust. What needs to happen is:

1. Each day at the end of the shift, respirators (if they are reusable) should be cleaned and inspected during that cleaning for any damage.
2. After the respirator is cleaned, it should be stored in a manner to prevent damage and contamination.
3. During the shift, when respiratory protection is not required, the respirator should be stored in a clean location, like a plastic bin,

Respirator Maintenance and Care

1. Inspect before use and during cleaning
2. Store to prevent damage or contamination
3. Keep Clean
4. Throw out N-95 respirators at the end of the day



<p>bag, or toolbox to keep it clean and prevent contamination when not in use.</p> <p>4. If you are using an N-95 dust mask, keep in mind that these masks are considered single use respirators and should be thrown out at the end of each shift.</p>	
<p>Thank you for watching lesson six of the Silica Exposure Training for the Cut Stone Industry., a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industry.</p> <p>This material was produced under grant number SH-37200-SH1 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.</p>	 <p>Silica Exposure Training for the Cut Stone Industry Training on the identification, evaluation, and control of silica exposure in cut stone and stone fabrication industries Developed by:</p> <p>GT Georgia Tech Enterprise Innovation Institute Safety, Health, and Environmental Services</p> <p>Funded by: U.S. Department of Labor Occupational Safety and Health Administration Susan Harwood Training Grant Program</p> <p><small>The material was produced under grant number SH-37200-SH1 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.</small></p>

Resources:

Sample written plan for respiratory protection and appendix c medical evaluation questionnaire: <https://oshainfo.gatech.edu/resources/> .

On the next page is a handout to guide participants to conduct a personal protective equipment hazard assessment. Have participants list out the job tasks they do each day, what potential hazards these job tasks may create, and what personal protective equipment they believe they should wear.

Certification of Personal Protective Equipment Hazard Assessment

COMPANY NAME: _____

DEPARTMENT(S) EVALUATED: _____

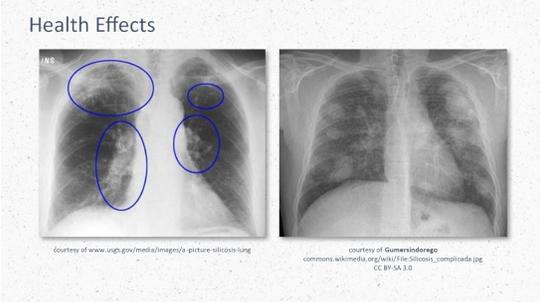
NAME/TITLE: _____

DATE: _____

Job	Hazards	PPE Required

Lesson Seven: Medical Surveillance and When to Report Health Effects

This lesson goes over the medical surveillance requirements according to the general industry respirable crystalline silica standard, 29 CFR 1910.1053.

Script for Lesson	Image, Video or, Slide
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson seven: medical surveillance and when to report health effects</p>	
<p>As covered in lesson three, RCS exposure can lead to the following adverse health effects:</p> <ul style="list-style-type: none">• Lung Effects including silicosis, lung cancer, pulmonary tuberculosis, and chronic obstructive pulmonary disease (COPD);• Kidney disease;• And a variety of autoimmune diseases, including lupus, rheumatoid arthritis and scleroderma. <p>The images shown on the left shows silicosis nodules and the image on the right is of a case of complicated silicosis.</p>	

OSHA mandates that employees be must be enrolled in a medical surveillance program when they are exposed silica above the action level for 30 days or more a year. Medical surveillance is the key for early identification of different exposure related health effects. This early identification has 2 key purposes. If employees have information about their health, THEY themselves can take steps to protect themselves and make different employment decisions, or to decrease their risk of progression or exacerbation of the disease. If the EMPLOYER has early info, they can make changes to the workplace to reduce or eliminate exposure.

Dr. Robert Cohen is quoted as saying, “These diseases...are not relics of the past. We see patients who are coming in from foundries, coming in from stone cutting operations, from little construction jobs and sites, with silicosis.”

Medical Surveillance Requirements

Purpose

- o Allow for early identification of exposure -related health effects



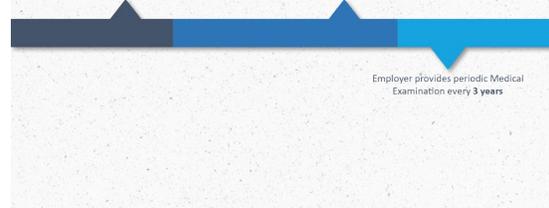
Employers must make medical surveillance available at no cost to the employee, and at a reasonable time and place (including cost of travel and time spent taking the medical exams), for each employee who will be occupationally exposed to respirable crystalline silica at or above the action level for 30 or more days per year. The employer must make sure that all medical examinations and procedures are performed by a “Physician or other licensed health care professional” (PLHCP).

The employer must make available an initial (baseline) medical exam within 30 days after initial assignment, unless the employee has received a medical examination within the last three years. The employer then must provide periodic medical examinations every three years that include the medical work history, physical exam, chest x-ray, and pulmonary function test and they can be done more frequently if recommended by the PLHCP.

Medical Surveillance Requirements

Medical Surveillance available if above
Action Level for 30+ days/year

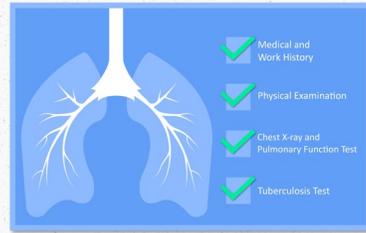
Medical Examination performed within
30 days after initial assignment



The medical examination includes the following parts:

- A medical and work history, with emphasis on: past, present, and anticipated exposure to respirable crystalline silica, dust, and other agents affecting the respiratory system; any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (such as shortness of breath, cough, and wheezing); history of tuberculosis; and smoking status and history.
- A physical examination with emphasis on the respiratory system.
- A chest X-ray interpreted and classified by a NIOSH-certified B Reader and a pulmonary function test.
- And finally a tuberculosis test.

Medical Surveillance Requirements



So let's go into a little more detail for what to expect during the exam. Typically, a tuberculosis test or TB test is done only during the initial exam. Remember how in lesson three we discussed how the risk for TB increases if you are also exposed to silica. The American Thoracic Society recommends that if you have been diagnosed with silicosis or been exposed for 25+ years, you should be tested annually for TB.

For the pulmonary function test, there are two parts to the test: a forced vital capacity (FVC) and forced expiratory volume. This test must be administered by a spirometry technician. Other additional testing can be performed on a case-by-case basis depending on signs/symptoms and clinical judgement.

The chest x-ray portion of the exam is necessary to diagnose silicosis, monitor the progression of silicosis, and identify associated conditions such as TB. A chest X-ray should be interpreted and classified according to a NIOSH-certified B Reader. Depending on how the x-ray looks, the employee may receive a recommendation for

Medical Evaluation of Employee

- Tuberculosis (TB) testing
- Pulmonary function testing must be performed on the initial and every three years
- A Chest X-Ray
 - Initial examination and every three years
 - Must be read by a NIOSH-certified B Reader
 - May receive referral to Specialist
- Any other additional test



referral to see a Board Certified Specialist in Pulmonary Disease or Occupational Medicine.

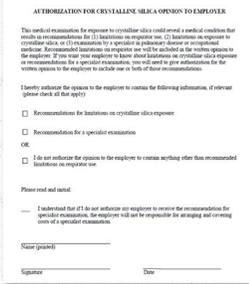
Under the respirable crystalline silica standards, the physician or licensed healthcare provider may determine it is necessary to order additional tests. This decision can be made on a case-by-case basis depending on individual signs or symptoms and clinical judgment. For example, if an employee reports a history of abnormal kidney function tests, the doctor may want to order a baseline renal function tests Or, they may order annual TB testing for silica-exposed employees who are at high risk of developing active TB infections. Additional tests that physicians or licensed healthcare providers may order based on findings of medical examinations include, but are not limited to, chest computerized tomography (CT) scan for the lung or COPD, testing for immunologic diseases, and cardiac testing for pulmonary-related heart disease.

Current research also recommends that individuals working with engineered stone be offered a CT in additional to the required chest x-ray.

Once the medical surveillance examination has been completed, the employer must ensure that the PLHCP explains to the employee the results of the medical examination and provides the employee with a written medical report within 30 days of the examination. The written medical report must contain a statement indicating the results of the medical exam, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to respirable crystalline silica or any medical conditions that require further evaluation or treatment. In addition, the physician or licensed healthcare provider's written medical report must include any recommended limitations on the employee's use of respirators, any recommended limitations on the employee's exposure to respirable crystalline silica. The physician or licensed healthcare provider should also make any referrals to a Specialist is necessary.

Report for Employee

- Reported within 30 days
- Contains:
 - Any condition placing the employee at increased risk
 - Any conditions requiring additional follow-up
- Limitations on respirator use
- Limitations for exposure
- Additional referral to specialist (if warranted)

<p>Employers must also receive a medical opinion from the physician or licensed healthcare provider within 30 days of the employee medical evaluation. This report should include: the date of the exam, a statement that the examination has meet requirements of the standard, any recommended limitations on the employee’s use of respirators, any recommended limitations on the employee’s exposure to RCS, OR a statement that the employee should be examined by a specialist if needed.</p>	<p>Report for Employer</p> <ul style="list-style-type: none"> ○ Reported within 30 days ○ Contains ONLY: <ul style="list-style-type: none"> • Date of Exam • Certification that exam met OSHA requirements • Limitations on respirator use • IF EMPLOYEE PROVIDED WRITTEN AUTHORIZATION: <ul style="list-style-type: none"> • Limitations for exposure • Additional referral to specialist (if warranted) 
<p>Thank you for watching lesson seven of the Silica Exposure Training for the Cut Stone Industry, a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industries.</p> <p>This material was produced under grant number SH-37200-SH1 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.</p>	

Resources

Medical Surveillance Guidelines for the silica standard: <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1053AppB> .

Lesson Eight: Housekeeping

This lesson goes over the housekeeping requirements while working with respirable crystalline silica.

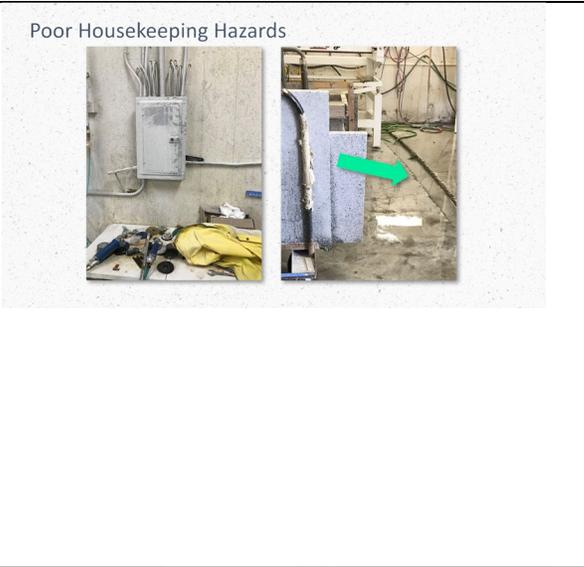
Script for Lesson	Image, Video or, Slide
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson eight: Housekeeping</p>	<p data-bbox="909 556 1047 619">Lesson Eight: Housekeeping</p> 
<p>Keeping a fabrication shop clean can be a huge challenge. Depending on the type of engineering controls implemented at the site, there may be lots of water, dust, or slurry or mud to manage. However, since the dust, water, and slurry or mud will contain silica, there are some important restrictions outlined in the Silica standard that are intended to prevent exposure to respirable crystalline silica.</p> <p>These restrictions include no dry sweeping or dry brushing, no use of compressed air (unless that compressed air is used in conjunction with a ventilation system) or there is absolutely no other method available. Let’s take a look at why.</p>	<p data-bbox="909 913 1047 934">Housekeeping</p> <ul data-bbox="909 940 1112 1018" style="list-style-type: none">○ No dry sweeping or dry brushing○ No use of compressed air○ Wet sweeping, HEPA-filtered vacuuming are allowed 
<p>Here is a video of an employee using compressed air to clean off a rack that had accumulated dust on its surface.</p> <p>As you can see, this process produces a tremendous cloud of respirable crystalline silica that now potentially could be inhaled by the employees working in this location.</p> <p>Not only that, but this does not remove the dust from the environment and only moves it around in the room to settle on another surface.</p>	

Other housekeeping hazards we see when we inspect countertop companies, include the use fans (intended to keep workers cool) that end up blowing dust around the plant and not storing items in the proper place leading to things like eye wash bottles/station being blocked for employees use.



In the first photo, we have an electrical panel that is covered in silica dust with a work table pushed underneath of it cluttered with tools and clothing. This is a hazard not only because there is dust on the panel, but the working space that is required to be kept free and clear around the panel is being used for storage, which is a violation of OSHA rules.

In the second photo, the drains that are supposed to be used to remove the water used during fabrication from pooling on the floors are clogged with mud and debris, creating dangerous walking and working surfaces. And these are just a few examples of how poor housekeeping can lead to hazardous conditions. So What is a company to do?



First, if using water to control dust in the shop, make sure the drains are kept clear so that walking and working surfaces can be kept clear of pooling water.

In this video, you can see the water coming off of the CNC machine and going into the floor drains below. And in this second video, you can see water coming off of a slab polisher and going into the drains.



Employers must restrict housekeeping practices that would expose workers to silica (such as prohibiting the use of compressed air and dry sweeping/clean-up methods). This is why at the end of each shift the fabrication/polishing areas should be completely cleaned while the area is still wet. This will hopefully remove a majority of the RCS from the floor, which can become airborne again once the water had dried and the dry area is disturbed by feet or forklifts. Tools



like the Windsor floor scrubber, which has HEPA filters and is pictured here may also assist in cleaning shop floor and removing settled RCS.

If you don't have access to floor cleaners, let's look at housekeeping being done in a way to prevent exposure to silica dust using a hose and a squeegee brush. Here you see an employee using water and a squeegee to clean up the floors at the end of the shift. This method keeps the dust out of the air and the workers safe.



Video of employees performing afternoon cleanup (sides 10 & 11 of ppt)

Another option for housekeeping is to use a vacuum system with a high efficiency particulate air [filter] or HEPA filter. These types of filters are able to capture the fine silica particles in a way that a shop vac from your local hardware store without a HEPA filter would never be able to capture the dust. These HEPA vacuum systems come in both wet and dry systems that can also incorporate water. They can be floor push models, ride on style, or even backpack systems for employees to walk around the shop and clean. However, all vacuum systems must also contain a label to identify them as containing silica dust. Take great care and follow manufactures instructions when changing out the filters and emptying these vacuums, as the filter change out process can be a source of significant exposure.

Other Options for Keeping the Shop Clean

HEPA Vacuum Systems

- o Come in both dry and wet systems
- o Can be floor push models, ride on, or even backpack systems
- o Must be labeled for silica dust

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Silica Exposure Training for the Cut Stone Industry

Training on the identification, evaluation, and control of silica exposure in cut stone and stone fabrication industries

Developed by:



Georgia Tech Enterprise Innovation Institute
Safety, Health, and Environmental Services

Funded by:
U.S. Department of Labor
Occupational Safety and Health Administration
Susan Harwood Training Grant Program

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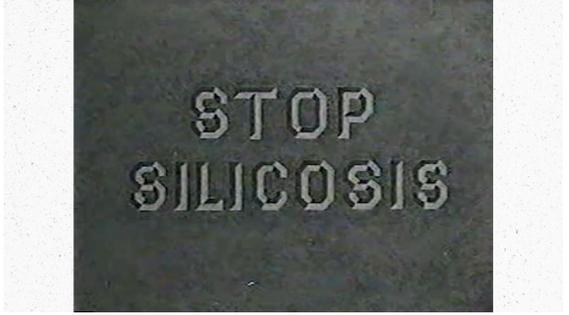
Resources

Have participants discuss the housekeeping practices at their workplace. Ask participants:

- Do they use compressed air to clean off surfaces or their body at the end of the shift?
- What barriers exist to prevent the use of proper housekeeping measures?
- What tools do they need in their workplace to better manage housekeeping?

Lesson Nine: Know Your Rights

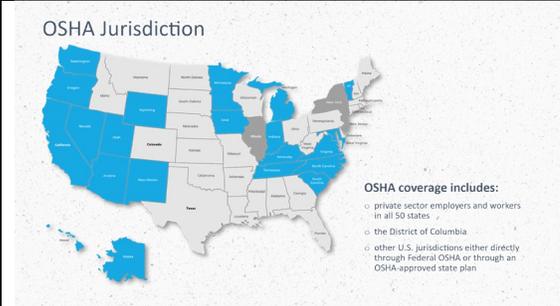
This lesson goes over the rights of employees according to the OSH Act

Script for Lesson	Image, Video or, Slide
<p>Welcome to the Silica Exposure Training for the Cut Stone Industry. This training covers the identification, evaluation, and control of silica exposures in cut stone and stone fabrication industries. The training was developed by Georgia Tech’s Safety, Health, and Environmental Services group with funding from the US Department of Labor’s Susan Harwood Training Grant Program.</p> <p>This is lesson nine: know your rights.</p>	
<p>Before we look at your rights today on the job, let’s take a look back to how things were when it comes to silica exposure in the past.</p>	
<p>It was not until 1970, with an act of Congress, the Occupational Safety and Health Administration (OSHA) was created. Known as the OSH Act, it assured safe and healthful working conditions for men and women by setting and enforcing standards as well as providing training, outreach, and education and compliance assistance.</p> <p>When OSHA was created, an estimated 14,000 workers were killed on the job each year, or about 38 every day. Over the past 50-plus years of protecting workers, OSHA has made great strides in workplace safety and health. However, significant hazards and unsafe conditions still exist in U.S. workplaces. Each year more than 3.3 million working men and women suffer a serious job-related injury or illness. Millions more are exposed to toxic chemicals that may cause illnesses years from now. Including silica</p>	

OSHA covers private sector employers and workers in all 50 states, the District of Columbia, and other U.S. jurisdictions either directly through federal OSHA or through an OSHA-approved state plan.

State plans are OSHA-approved job safety and health programs operated by individual states instead of federal OSHA. An example would be Cal-OSHA (in California) or North Carolina OSHA. OSHA approves and monitors all state plans and provides as much as 50 percent of the funding for each program. State-run safety and health programs must be at least as effective as the federal OSHA program. The states in blue have approved State Plans and the states in grey cover state employees as well.

Graphic: A picture of the United States with the State Plans in blue and the Federal Plans in white.



Employers must also:

- Perform tests in the workplace, such as air sampling or noise monitoring, as required by some OSHA standards.
- Provide hearing exams or other medical tests required by OSHA standards (if applicable).
- Post injury/illness information so that employees can review them.
- Prominently display the official OSHA "Job Safety and Health - It's the Law" poster that describes rights and responsibilities covered by the OSH Act.
- AND employers MAY NOT retaliate or discriminate against workers for using their rights under the OSH Act to report hazards that could lead to or have caused a work-related injury or illness.



Employers have the responsibility to provide a safe workplace free from serious hazards and must follow all OSHA safety and health standards.

OSHA requires that employers first try to eliminate or reduce hazards by making feasible changes in working conditions rather than relying on personal protective equipment – also known as PPE (such as masks, gloves, earplugs); and if an employer provides PPE, then the employer must train the employees on WHEN and HOW to use the PPE.

Any training given by the employer must be in a language that the employees can understand.

Temporary workers are also entitled to the same protection against retaliation as full-time workers.

Employers may not take action against employees for participating in protected workplace activities (such as: filing a complaint or voicing concerns about workplace hazards to supervisors). If employees feel that their concerns are not being addressed by their employer, they are protected by the Whistleblowers' Protection Act to file a complaint with OSHA without fear of retaliation or losing their job.

If OSHA shows up on site, workers can participate during an OSHA inspection. They may speak with an inspector in private without retaliation from an employer. Workers can see the OSHA citations and any other documentation.

Even if you are an temporary worker, you are entitled to the same protections as any other worker. What this means is that your host employer cannot ask a staffing agency to remove a worker for reporting safety and health hazards. If the staffing agency complied and removed the worker, both employers may be investigated to determine if either one, or both, retaliated against the employee.

Retaliation can include:

- Blacklisting
- Demoting
- Denying overtime or promotion
- Disciplining
- Denying benefits
- Failing to hire or rehire
- Firing or laying off
- Intimidation

Worker's Rights

- Workplace free of recognized hazards
- Report safety and health concerns and/or injuries and illnesses without retaliation
 - File a discrimination complaint under Section 11 (c) of the OSH Act, which prohibits discharge or discrimination by "any person" against any employee for OSHA-related activity
 - File a complaint if punished or discriminated against for acting as a "whistleblower" under the additional federal laws for which OSHA has jurisdiction
- Receive appropriate training in a language and vocabulary that workers understand



Worker's Rights

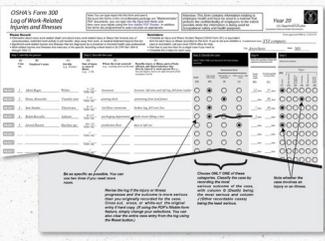
- Request an OSHA inspection at your facility (confidential)
- Participate in an OSHA inspection
- Speak to OSHA inspector in private
- See OSHA citations
- Request medical records, tests that measure hazards and injury/illness log



Whistleblower Protection

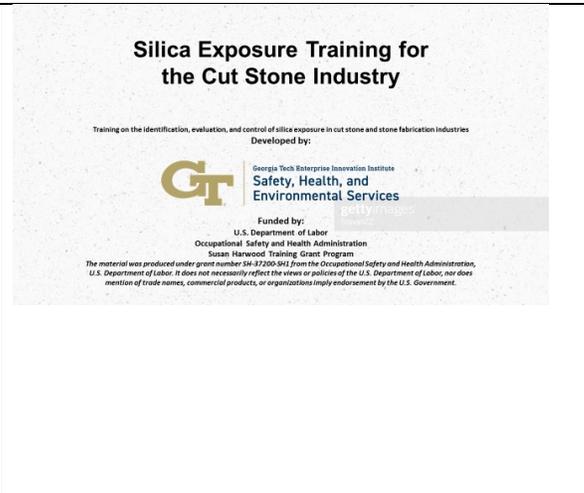
- Temp workers are entitled to the same protections as all other covered workers
- Employers and Staffing Agency are responsible & can be held accountable for
 - Retaliating/Exposing workers to hazards
 - against workers for reporting hazardous conditions
- Protected activities: report injuries, raise concerns to employer/OSHA/other government agencies about unsafe/unhealthful working conditions



<ul style="list-style-type: none"> • Making threats • Reassignment to a less desirable position, including one adversely affecting prospects for promotion • and/or Reducing pay 	
<p>Employers are required to maintain records of any injuries or illnesses that occur as a result of work related activities. Adequate records of injuries and illnesses must be maintained and kept on file for at least 5 years. Employers that have more than 10 employees must keep the OSHA logs.</p> <p>All employers must comply with OSHA standards and report to OSHA accidents that involve fatalities, amputations, loss of an eye, or hospitalization of 1 or more employees. Fatalities must be reported within 8 hours and amputations, loss of eye or hospitalizations must be reported within 24 hours.</p>	<p>Recordkeeping and Reporting Requirements</p> <ul style="list-style-type: none"> o Employers must maintain records of occupational injuries and illnesses o Employers with 10 or fewer employees are exempt from recordkeeping unless selected by the government to participate in the Annual Survey <p>All employers must:</p> <ul style="list-style-type: none"> o Comply with OSHA standards o Report to OSHA: <ul style="list-style-type: none"> o Within 8 hours: Any accident that results in a fatality o Within 24 hours: Amputations, loss of an eye, or hospitalization of 1 or more employees
<p>The OSHA 300 log contains descriptions of recordable injuries and illnesses that occur on the job.</p> <p>The OSHA recordkeeping forms must be maintained for 5 years at the establishment.</p> <p>Your employer is required to update logs to reflect any changes that occur and post the summary log from February 1 to April 30th of the following year.</p>	<p>Recordkeeping Forms</p> 
<p>OSHA’s website has a lot of information on employee and employer rights and responsibilities. The website also has a lot of information and documents that can be helpful for employee training, including eTools, presentations, Fact Sheets, and Quick Cards.</p> <p>We work with the Georgia Tech Safety and Health Consultation Program. We provide free on-site safety and health consultations for small businesses in the state of Georgia. The consultation program exists in every state. It is a no charge service and completely confidential. Most cut stone countertop fabrication companies qualify to participate in the OSHA consultation program. Consultants are able to conduct noise monitoring and assess employee exposure to respirable crystalline silica. Ask your employer to request the service through the links provided in the video description.</p>	<p>Sources for Reference</p> <ul style="list-style-type: none"> www.osha.gov <ul style="list-style-type: none"> o E-tools, standards, presentations, etc. www.oshainfo.gatech.edu <ul style="list-style-type: none"> o Free, on-site safety and health consultation o Completely confidential from OSHA www.osha.gov/consultation/directory-text

Thank you for watching lesson nine of the Silica Exposure Training for the Cut Stone Industry., a training on the identification, evaluation, and control of silica exposure in the cut stone and stone fabrication industry.

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Resources

OSHA website: www.osha.gov

- E-tools, standards, presentations, etc.

OSHA Consultation Program for the state of Georgia: www.oshainfo.gatech.edu

- Free, on-site safety and health consultation
- Completely confidential from OSHA

OSHA Consultation Programs for other states:

<https://www.osha.gov/consultation/directory-text>