Engineering Controls for Engineered Stone

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Safety, Health, and Environmental Services
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

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Remembering my WHY
Do not eat, drink or smoke when using this product. (P270)
Wear protective gloves, protective clothing, eye protection, face protection. (P280)
Potential Health Effects:
Inhalation: Do not breathe dust. See “Health Hazards” in Section 11 for more details.

**Section 3 – Composition/Ingredients**

<table>
<thead>
<tr>
<th>Composition</th>
<th>Cas#</th>
<th>Estimated % by Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica as quartz</td>
<td>CAS: 14808-86-7</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>CAS: 13463-67-7</td>
<td>0-10%</td>
</tr>
<tr>
<td>Cristobalite</td>
<td></td>
<td>0-10%</td>
</tr>
<tr>
<td>Other Natural Stone / Minerals²</td>
<td>N/A</td>
<td>0-10%</td>
</tr>
<tr>
<td>Polyester Resins</td>
<td>Mixture</td>
<td>0-10%</td>
</tr>
</tbody>
</table>
Companies MUST:
- Address each aspect of this framework
- Plan for controls to fail
- Continually look for methods to improve controls
- Maintain installed controls
- Address Housekeeping daily
- Train workers
- Supervise Workers
- Remember the installers

Image by: NIOSH 2021
# Georgia Tech’s Similar Exposure Groups (SEG)

<table>
<thead>
<tr>
<th>Equipment/task</th>
<th>Engineering and work practice control methods</th>
<th>Other Considerations</th>
<th>Respiratory Protection</th>
</tr>
</thead>
</table>
| **SEG 1: Automated Tool Operators** | • Water-fed tools that can be programmed so the worker does not have to stay in the vicinity.  
• Operate and maintain tools in accordance with the manufacturer’s instructions. | Maintenance and Housekeeping in the Area  
Critical | Depends on Air Sampling |
| **SEG 2: Small Tool Operators** | • Use hand tools with an integrated water delivery system that continuously feeds water.  
• Operate and maintain tools in accordance with the manufacturer’s instructions.  
• Consider additional ventilation systems to pull silica/ and moisture out of the air and out of the worksite. | Maintenance and Housekeeping in the Area  
Critical  
Watch for Water Spray and Block Vision | Depends on Air Sampling |
| **SEG 3: Fabrication/Lamination** | • Use wet methods…. | Address the WHY employees do this work dry | PAPR or greater |
| **SEG 4: Support Workers: installation and other support workers** | • Housekeeping drives background silica exposure in shop.  
• Driving forklifts, moving equipment, use of compressed air to redistribute settled dust.  
• Installation is a potential source of exposure if cuts are made in the field. | Are persons not cutting/grinding on slabs wearing respiratory protection? | Depends on Air Sampling |
SEG 1:
Automated Tool Operators
Silica still present with wet methods
The Slurry Has to Go Somewhere

• Water and Silica Slurry Must be Removed from the Work Environment
  – Dries over night and gets kicked up when workers re-enter the environment
SEG 2:
Small Tool Operators
Silica Dust and Water Clogging the Respirator
Wet Methods and….

- Additional ventilation controls
- Consider negative pressure to pull air up and out of the room.
- Consider point source ventilation systems to pull dust and moisture (droplets containing silica) away from work.
- Daily housekeeping is ESSENTIAL
- Supervision and Training for tool use
- Ask WHY when an employee doesn’t comply:
  - Is vision obstructed?
  - Is it a timing issue?
  - Is it a comfort/heat stress issue?

Observe how the negative air system is keeping the dust within the polishing area.
SEG 3: Fabrication/Lamination
Lamination

• Process of adhering two slabs together
  – Used for edging or longer slabs that require two pieces
  – Adhesive will not cure in the presence of water
  – Workers prefer to adjust the slab while the adhesive is curing
    – hence the dry fabrication
  – How to do this wet? Glue, wait, then fabricate.
    • Scheduling the time
Example of Controls No Longer Functioning
Water Curtains

• Pull dust through the “waterfall” curtain and dust gets pulled into a tank
SEG 4:
Support Workers: installation and other support workers
Installation Example

- Installer
  - Was wearing a 1/2 Mask Elastomeric Respirator with P-100 filters
  - Performed Two installations:
    - Morning and Afternoon
    - Both Quartz/Engineered Stone

- Morning Installation:
  - No adjustments, cuts, or polishing required
  - Includes several hours of prep and drive time
  - Result: <5.6 µg/m³ respirable silica

- Afternoon Installation:
  - Several adjustments and cuts needed to be done onsite
  - Includes several hours of prep and drive time and only a few minutes of cutting
  - Result: 34 µg/m³ respirable silica
Takeaways: Working With Fabricated Stone

- Provide Hazard Communication Training For Silica
- Provide and fit employees for Respiratory Protection
- Enroll Employees in a Silica Exposure Medical Surveillance Program
- Use Tools Fitted with Water and/or Ventilation to Reduce Dust
Any Questions

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