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# TOOLBOX TALK

## Topic: Silica Awareness

Date discussed with crews: _____

Toolbox talk delivered by (name): _____

### What Is Silica?

Silica is one of the most common minerals found in stone, sand, soil, and rock. It poses a hazard when these aggregates are processed and disturbed. Occupational silica exposure can take a few different forms including: Cristobalite, Quartz, Tripoli, Fused, and Silica fumes.

Cristobalite/Quartz are the most concerning of these types and present as crystalline dusts. This is also the most common way that silica shows up on construction projects.

### Where Silica Exposure Happens

| Common Work Activities Involving Silica | Why It's High Risk |
|---|---|
| Cutting, chipping, grinding, polishing concrete, mortar, brick/block | Generates fine respirable silica dust |
| Working with drywall systems | Drywall compound SDS may not list silica, but gypsum board can contain it |
| Processing aggregates | Frequently produces elevated exposure levels |
| Crushing and blasting stone | Can create very high airborne concentrations |
| Landscaping tasks (placing gravel, cutting stone) | Exposure can exceed occupational exposure limits |
| Abrasive blasting with silica sand | Silica sand is common and cost-effective—but highly hazardous |
| Cleaning surfaces during blasting | May involve additional hazardous substances beyond silica |

If you can see silica dust in the air, exposure levels may be above occupational limits. Respirable silica is usually too small to see—visible dust is a warning sign that controls may not be adequate.

### Health Effects of Silica Exposure

The health effects of silica exposure are well documented at this point. Prolonged inhalation of respirable dust containing silica may result in silicosis and increases the risk of lung cancer. Data collected by the Canadian Cancer Society has silica exposure placed as the second leading cause of occupational cancers behind only asbestos in both Nova Scotia specifically and Canada as a whole.

### What Is Silicosis?

Silicosis is a progressive lung disease with no known cure. It is the body's reaction to silica exposure. Silica dust is fine enough that it can pass through the body's defenses, get deep into the alveoli of the lungs, and never leave. White blood cells attempt to remove the silica particles and this causes hardening and scarring of the lungs.

The severity of silicosis depends on the concentration of silica dust to which a worker is exposed and the duration of exposures.

Crystalline silica inhaled in the form of quartz or cristobalite is **ALSO** carcinogenic to humans.

Other serious health effects linked to respirable crystalline silica exposure include lung cancer, COPD, kidney disease, and rheumatoid arthritis.

### There are three major types of Silicosis:

| Chronic | Accelerated | Acute |
|---|---|---|
| Most common form of silicosis | Similar to chronic silicosis but develops faster | Develops very rapidly. Symptoms may appear within 8–18 months of first exposure |
| Symptoms usually appear after 10+ years of exposure | Symptoms appear sooner than chronic silicosis | Rapid progression of disease |
| Progresses and worsens over many years | Lung scarring occurs earlier | Leads quickly to respiratory failure |
| Effects are irreversible | Irreversible lung damage | Symptoms include shortness of breath, fever, cough, and weight loss |

### Controls

Using water as a dust suppressant is the best control when possible. This will suppress the dust for all workers in the area, as well as the general public.

If water cannot be used and the area is suitable, mechanical ventilation is another option which protects everyone involved. This is rarely an option in construction.

PPE such as using an appropriately rated disposable respirator (N95 or higher) when making small cuts/chipping for short amount of time. If there is a high concentration of silica possible you should use at minimum a half-face respirator with P100 filters.

What type of respirator – from disposable N95 to PAPR with P100's – is adequate will be determined by levels of exposure. Each respirator has a level of protection it can provide.

The occupational exposure limit for respirable crystalline silica is 0.025 mg/m$^3$ (8-hour TWA). High-frequency or high-exposure tasks should be air tested to confirm that controls and respiratory protection are adequate.

Qualitative or quantitative fit testing for tight fitting respirators is required both to keep workers safe, and to be in compliance with regulations. If these are unavailable, a PAPR with a hood provides the highest level of protection.

### Generic Respirator Use

- Reusable respirators offer increased protection and comfort for tasks involving respiratory hazards. When required, they must be worn to protect workers and remain compliant with safety regulations
- The respirator should be inspected before each use for defect. If any defects are found, tag and remove from service immediately
- Examine all plastic parts for cracking/wear/damage
- Examine the face seal for cracks, tears, or dirt build up. Dirt build up can break the seal
- Examine exhalation valves for distortion, cracks, tears
- Ensure the correct filters are selected for the hazard