



Respirable Crystalline Silica Health Hazards

Crystalline silica is a common mineral found in many naturally occurring and man-made materials. Naturally occurring materials such as soil, sand and granite can contain crystalline silica. Man-made materials such as concrete, brick, block and mortar can also contain crystalline silica. When these naturally occurring or man-made materials are chipped, cut, drilled or ground the crystalline silica can become respirable sized particles. Respirable crystalline silica is characterized as a very small particle, typically at least 100 times smaller than ordinary sand found on beaches or playgrounds.

When these respirable sized crystalline silica particles are breathed into the lungs, they have the potential to cause multiple diseases, including silicosis. Silicosis occurs when the particles cause scar tissue to form in the lungs. This scar tissue reduces the lungs' ability to take in oxygen and makes one more susceptible to lung infections like tuberculosis. Smoking adds to the damage caused by breathing respirable sized crystalline silica.

There are three types of silicosis: accelerated, acute and chronic.

- **Accelerated Silicosis**: can occur after 5-10 years of high exposures. Symptoms include severe shortness of breath, weakness and weight loss. The onset of these symptoms takes longer than in acute silicosis.
- **Acute Silicosis**: occurs after only a few months or up to 2 years of exposures to extremely high concentrations of respirable crystalline silica. Symptoms include severe disabling shortness of breath, weakness and weight loss which often leads to death.
- **Chronic Silicosis**: is the most common and occurs after 15-20 years of moderate to low exposures. Symptoms may or may not be obvious, but can be detected on a chest x-ray. As chronic silicosis progresses, the person may experience shortness of breath upon exercising and have clinical signs of poor oxygen/carbon dioxide exchange. Later stages include fatigue, extreme shortness of breath, chest pain or respiratory failure.

Other health effects of breathing in respirable crystalline silica include lung cancer, chronic obstructive pulmonary disease (COPD) and kidney disease. The main symptom of COPD is shortness of breath due to the difficulty breathing air into the lungs. COPD is not usually reversible and may worsen over time. Kidney failure has been observed in abrasive blasters with high silica exposure who were also suffering from silicosis.

There is no cure for silicosis, but it is preventable by implementing engineering and/or work practice controls to prevent or reduce the generation of respirable crystalline silica. When these methods are not sufficient, the use of personal protective equipment may also be an option for reducing your exposure to respirable crystalline silica.



Exposures to respirable crystalline silica can occur when the following tools are used on concrete, brick, block, stone, mortar and other materials that contain crystalline silica such as asphalt:

<ul style="list-style-type: none"> • Stationary Masonry Saws 	<ul style="list-style-type: none"> • Handheld Power Saws
<ul style="list-style-type: none"> • Walk-behind Saws 	<ul style="list-style-type: none"> • Drivable Saws
<ul style="list-style-type: none"> • Rig-mounted core Saws or Drills 	<ul style="list-style-type: none"> • Handheld and stand-mounted Drills-Including Impact & Rotary Hammer Drills
<ul style="list-style-type: none"> • Dowel Drilling Rigs 	<ul style="list-style-type: none"> • Vehicle-mounted Drilling Rigs
<ul style="list-style-type: none"> • Jackhammers and Handheld Powered Chipping Tools 	<ul style="list-style-type: none"> • Handheld Grinders
<ul style="list-style-type: none"> • Walk-behind Milling Machines and Floor Grinders 	<ul style="list-style-type: none"> • Drivable Milling Machines
<ul style="list-style-type: none"> • Crushing Machines 	<ul style="list-style-type: none"> • Heavy Equipment & Utility Vehicles When Used to Abrade or Fracture Silica-containing Materials or During Demolition Activities & Tasks such as Grading and Excavating

[Table 1](#) within the Occupational Safety and Health Administration Silica Construction Standard ([29 CFR 1926.1153](#)) lists 18 common construction tasks that generate high exposures to respirable crystalline silica along with engineering controls, work practices and respiratory protection that effectively protect workers. OSHA believes that fully and properly implementing the engineering controls, work practices and respiratory protection listed for the tasks in [Table 1](#) will effectively reduce one's potential for developing silicosis and other disease associated with breathing respirable crystalline silica.

Additional silica resources can be found on the [DPS Public Sector Employee Safety web page](#) as well as [OSHA's Silica web page](#). Questions or comments can be directed to Ann.Jurkowski@wisconsin.gov.