



Protecting you for life's *best* moments.

Crystalline Silica:

What does it mean for you?



What is Respirable Silica?

Crystalline silica is an abundant natural material that is found in soil, stone and sand and is also present in many construction materials such as brick, mortar and concrete.

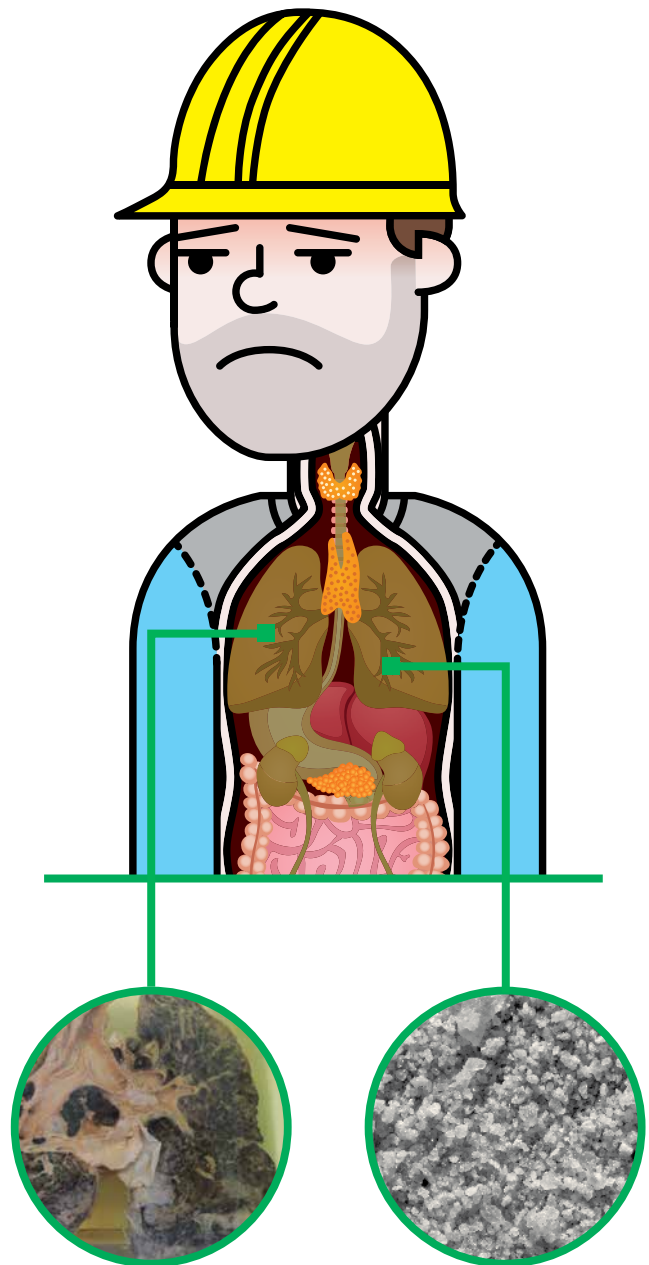
It becomes respirable when any of these materials are cut or broken down into fine particles. Typically, silica dust or respirable crystalline silica is created by blasting, chipping, cutting, grinding and drilling.

More than 85% of workers exposed to respirable crystalline silica work in the construction industry - totaling over 2.3 million workers. Other industries where workers are exposed include: asphalt roofing materials, concrete products, cut stone, dental laboratories, foundries, jewelry, porcelain enameling, pottery, railroads, ready-mix concrete, shipyards, structural clay products, and support activities for oil and gas operations.

Effects of Inhaling Crystalline Silica

Inhaling crystalline silica can have debilitating and fatal effects. The effects of inhaling crystalline silica have a cumulative effect over time and can go unnoticed for up to 10 years. Below are some of the illnesses that can be caused by excessive inhalation of crystalline silica:

- **Silicosis** - When crystalline silica enters the respiratory system, it causes permanent lung damage. The lung tissue reacts to the silica particles by developing fibrotic nodules and scarring inside the lungs around the trapped particles. When the nodules grow larger, this causes breathing to become difficult. The damage is irreversible, and this can result in death.
- **Tuberculosis** - Increased risk for those with silicosis.
- **Chronic Obstructive Pulmonary Disease (COPD)**
- **Kidney Disease**
- **Lung Cancer.**



Lung with silicosis and tuberculosis.

What is the Standard for Silica Protection?

The Permissible Exposure Limit (PEL) as stated by Occupational Safety and Health Administration (OSHA) for crystalline silica for workers is 50µg/m³ averaged over an 8 hour day.

Employers must:

- Measure how much silica their employees are exposed to, if it is likely to be above the action limit of 25 µg/m³ averaged over an 8 hour day.
- Provide their employees with protection from crystalline silica if over 50µg/m³.
- Limit worker access to areas where silica levels are above the PEL.
- Take measures to control the dust where silica levels are above the PEL.
- Provide respiratory protection where dust control measures fail to reduce the silica levels to below the PEL.
- Implement alternative administrative procedures that expose workers to less silica whenever feasible.
- Develop and execute a written exposure control plan.
- Offer regular medical examinations for workers exposed to the action level for over 30 days per year.

How much is 50 µg/m³?

One gram of respirable crystalline silica (equivalent to a packet of artificial sweetener) would generate an exposure level above the PEL in a space the size of a 13ft high football field.

Limit exposure to respirable crystalline silica by:

- Using water to control dust. Such as, concrete saws with integrated water delivery and slurry blasting. This reduces the amount of airborne crystalline silica, but does not eliminate it.
- Using dust extraction systems. This removes most of the airborne crystalline silica from the air, however depending on the setup, it does not eliminate exposure.
- Using a respirator. When choosing your respirator check if a tight-fitting or loose-fitting respirator will work best for you.

1 GRAM OF SILICA WOULD GENERATE AN EXPOSURE LEVEL ABOVE THE PEL IN A SPACE THE SIZE OF A 13FT HIGH FOOTBALL FIELD
(EQUIVALENT TO A PACKET OF ARTIFICIAL SWEETENER)

Tight-fitting vs. Loose-fitting Respirators



Tight-fitting Respirators

Tight-fitting respirators are negative pressure and rely on a tight seal against the user's face using their lungs to draw the air in for it to be filtered. These respirators require fit-testing and the user to be constantly clean shaven for the seal to remain.



Loose-fitting Respirators

Loose-fitting respirators, on the other hand, are positive pressure and the air is supplied to the user by either powered air purifying respirators (PAPRs) or a supplied airline respirator (SAR) from a compressed air stream. This air is then filtered as the air is propelled forward and the user can breathe as they normally would.

Sources

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