Silica - ToxFAQs™

What is silica?

Silica is found naturally in the environment. It is a compound made from silicon and oxygen and can come in different forms. All silica forms are made from the same chemicals but can have different structures. Silica is divided into two main groups, crystalline silica and amorphous silica (non-crystalline silica). The most common type of crystalline silica is quartz. Other types also exist, but they are less common.

Silica compounds are found throughout the environment in rocks, sand, clay, soil, air, and water. Silica is used in many commercial products, such as bricks, glass and ceramics, plaster, granite, concrete, cleansers, skin care products, and talcum powder. Some forms of amorphous silica are used as food additives, food wrappings, toothpaste and cosmetics.

How could I be exposed to silica?

The general population is exposed to silica through air, certain types of indoor dust (such as from concrete), food, water, soil, and some consumer products. The exposure of greatest concern is through air. However, most silica particles encountered by the general population in air are too big (non-respirable) to breathe into the lungs and cause problems.

Workers in certain industries are exposed to much higher levels of silica than the general population. For example, activities like blasting, cutting, drilling or grinding materials that contain silica can cause workers to breathe air containing *small particles* (respirable) of silica dust. This is a serious health concern for workers in occupations involving materials containing crystalline silica, such as construction, mining, sandblasting, and porcelain manufacturing. **Exposure of workers to crystalline silica is recognized as an important occupational (job) hazard.**

How can *crystalline* silica affect my health?

No known health effects are found from exposure to crystalline silica at the levels normally found in the environment.

Many studies in **workers** have looked into possible relationships between crystalline silica exposure and harmful health effects. These studies show that **workers breathing small crystalline silica particles for a long time (typically years) can develop silicosis, a serious lung disease.** Crystalline silica is the only compound that causes silicosis. Studies in workers have also documented that silica can cause **chronic obstructive pulmonary disease (COPD), lung cancer, kidney failure, autoimmune diseases, and increased susceptibility to tuberculosis**.

Health problems from crystalline or amorphous silica are extremely rare in the general public; health problems occur to *workers* breathing in silica dust.

How can *amorphous* silica affect my health?

There are no known health effects from exposure to amorphous silica at the levels found in the environment or in commercial products (food additives and wrapping, toothpaste and cosmetics).

A few reports suggest that amorphous silica can cause respiratory dieases (but no silicosis) in workers. Studies in lab animals suggest that although breathing amorphous can cause lung inflammation and injury, it is less hazardous than crystalline silica.

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How can silica affect children?

It is unlikely that children in developed countries would have sufficient exposure to crystalline silica to be at risk for silica-related disease. If children were exposed to large amounts of small crystalline silica particles, as might occur during child labor in developing countries, they would likely be at risk for similar health effects as adults. If you think your child has had this type of exposure, talk to your child's doctor or nurse.

Can *crystalline* silica cause cancer?

Federal and international agencies have concluded that exposure to crystalline silica particles that are small enough to reach the lungs can cause lung cancer. The Department of Health and Human Services and the International Agency for Research on Cancer classify crystalline silica (respirable size) as a known human carcinogen (causes cancer).

These conclusions are based on studies in workers showing that **prolonged (long-term) inhalation of crystalline silica particles that are small enough to reach the lungs increase the risk for getting lung cancer. However, levels of these small particles are much higher than what is usually found in the general environment.**

Can *amorphous* silica cause cancer?

Studies of amorphous silica in workers and lab animals have not found cancer. Federal and international agencies have not made any conclusions on whether amorphous silica can cause cancer.

Can I get a medical test to check for silica exposure?

There are no medical tests to find out if you have been exposed to silica.

How can I protect myself and my family from silica?

Usual exposures of the general public to large particles of crystalline or amorphous silica are not known to cause any health effects in people without lung diseases like asthma. Therefore, **people don't need to take any special steps to avoid silica in their daily lives or avoid products containing silica. However, you should wear protective equipment (e.g. particle mask) if you engage in a hobby or activity that creates small dust particles by grinding or cutting materials that contain silica. Workers exposed to silica should avoid bringing dust home on their clothes.**

Workers who may be exposed for longer periods of time to respirable crystalline silica should talk to their supervisor or employer. The National Institute for Occupational Safety and Health (NIOSH) also has information: https://www.cdc.gov/niosh/topics/silica/.

For more information:

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at https://wwwn.cdc.gov/dcs/ContactUs/Form

Go to ATSDR's Toxicological Profile for Silica: https://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=1483&tid=290

Go to ATSDR's Toxic Substances Portal: http://www.atsdr.cdc.gov/substances/index.asp

Find & contact your ATSDR Regional Representative at http://www.atsdr.cdc.gov/DRO/dro_org.html