

Beyond the cutting and grinding.

Helping to reduce your exposure to respirable crystalline silica.

Every time you set foot on a new construction site, into the foundry or quarry, you take stock of the different risks and dangers to avoid. You spot small pieces of concrete flying into the air as your co-worker uses a pneumatic drill to break up a piece of pavement. You notice the dust as the rock and stone are drilled and cut. But what about the dangers you can't see? The tiny silica particles from the pavement and stone block that enter your respiratory system and potentially your lungs?

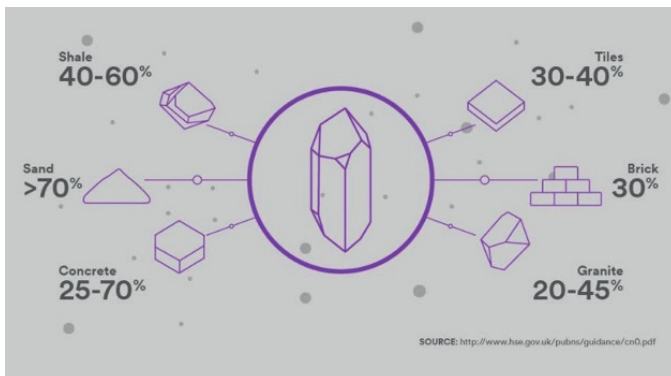


Figure 1 – Crystalline silica content in commonly used construction materials

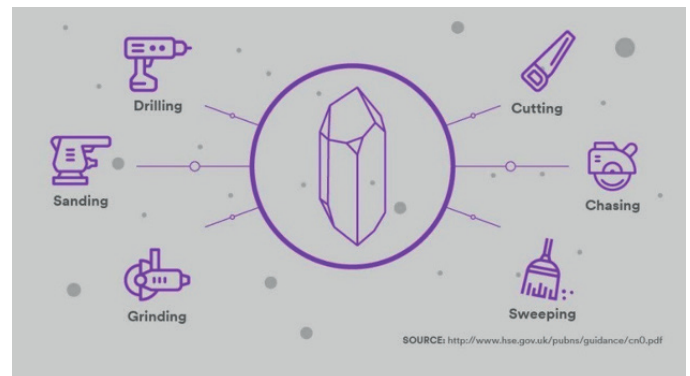


Figure 2 – Construction activities that may create respirable crystalline silica

What is crystalline silica?

Crystalline silica (silicon dioxide, SiO₂) is one of the most common naturally occurring minerals on the earth. In the form of quartz, it is a basic component of many soils, sands and rocks^[1], which are in turn used in products like concrete, brick, ceramic tiles, dental filings, jewellery, tombstones and more^[2].

How could it affect me?

When respirable crystalline silica particles are inhaled, they can make their way deep into your lungs. When that happens, the silica particles then cause scar tissue nodules to develop in the lungs^[2]. While it may take years to develop, this is the disease silicosis. Silicosis is a non-reversible lung disease with symptoms that can range from shortness of breath and chest pains to increased difficulty in breathing. It may eventually also be fatal. Exposure to respirable crystalline silica has also been recently associated with other lung diseases.

When am I at risk?

Crystalline silica is more likely to be present in the air when there is cutting, sawing, drilling or crushing of concrete, brick, ceramic tiles, rocks or stones, but also when handling sand and powdered silica. Examples of potential workplaces with these types of activities might include foundries, mines, and sites that use abrasive blasting^[3].

Workers in the construction industry are particularly at risk of exposure to respirable crystalline silica due to the high content in common construction materials and the types of activities undertaken on construction sites^[3] – see Figure 1 and Figure 2.



What can I do to protect my workers?

No matter where you work, it is essential to understand the different products and processes being used around your workplace, to help determine the appropriate controls (engineering and administrative), as well as protective gear, to reduce the potential risk.

Use appropriate controls

There are a few different ways of controlling dust levels in your workplace, which will help keep silica particles from becoming airborne. Controls should start with trying to eliminate the hazard, for example sourcing cut-to-size materials, or substitution of high quartz content materials to low (or no) quartz content alternatives. Many worksites will also opt for engineering controls like wet cutting, vacuum dust collection systems, or water misting of work sites to keep silica dust from becoming airborne. Administrative controls such as restricting access to controlled work areas, as well as adequate training should be used wherever possible. Finally, the use of PPE including respiratory protective devices when other controls do not adequately control exposures^[4].

Stay informed

Certain countries and regions have different rules and regulations around managing silica exposure so it's important to stay up to date on legal requirements and testing to help minimise risk.

Get the equipment that you need

Respiratory, ocular, hearing, head protective equipment, among others, is likely needed when cutting, sawing, drilling or crushing silica containing materials or conducting other activities that may result in exposure. Recommendations and regulations vary by country, so always check your national regulations.

Once you have a sense of the hazards and risks in your workplace, you'll want to take a look at 3M's full range of respiratory protection products, safety eyewear and coveralls to find the right PPE for your application. Whether it be a half-face respirator, full-face mask and filters or a heavy duty powered or supplied air helmet; all our products are designed to help you get the job done while you breathe comfortably and safely.

At any time, you can get in touch with one of our respiratory experts for personalised help on the selection and use of 3M products. Their job is help you through the process of selecting adequate and suitable products based upon your risk assessment, helping you keep your lungs safe so you can focus on what matters: doing your job properly and staying healthy for your loved ones and family.

Did you know?

In 2014/15, within the UK construction industry^[5]:

- **35 workers** sustained fatal injuries
- **5,500 workers** were diagnosed with new cases of occupational cancer
- **3,500 workers** died due to past exposure to asbestos
- **500 workers** died due to past exposure to silica

Did you know?

- In the UK, the Workplace Exposure Limit^[6] for Respirable Crystalline Silica is 0.1mg/m³ TWA
- 0.1mg RCS is illustrated below in Figure 3^[7]; this represents a typical maximum daily permitted dose in the UK

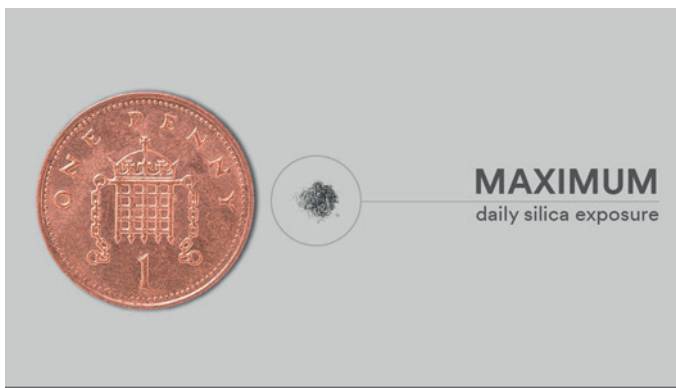


Figure 3 – Illustration of 0.1mg of respirable crystalline silica^[7]

Find out more

[hse.gov.uk/construction/healthrisks/cancer-and-construction/silica-dust.htm](https://www.hse.gov.uk/construction/healthrisks/cancer-and-construction/silica-dust.htm)

References

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