Silica dust

The dangers of silica dust

Trainer notes
In preparation for the presentation, please read the following.

- Please make sure you have access to speakers and that your computer’s volume is turned up.

- Depending on your computer’s security settings when opening the PowerPoint presentation, a pop-up menu similar to the one below may appear. Select **Enable external content for this session** and click OK.

- Additionally, the pop-up below may appear, select ‘Enable’ or ‘Enable Content’ depending on the version of PowerPoint you are using.

- You may also be asked to make the document a trusted document. Click on **Yes**. Once all the security checks are complete the presentation will be ready to be run.
15 PEOPLE A WEEK DIE IN BRITAIN FROM LUNG CANCER CAUSED BY SILICA AT WORK

- Click to move to the next slide
7,000 cases of lung cancer a year in the EU are due to silica dust exposure.
Worldwide exposure

The number of people exposed to silica dust at work:

- 500,000 UK
- 5 million EU
- 2.2 million USA
- 10 million India
- 23 million China

- Click to move to the next slide
Silica dust: This short presentation is designed to raise awareness among your employees of the risks from silica dust. It’s aimed at anyone who works around dust or in an environment where materials containing silica are used.

Support information

As well as using the straw walk, go to www.notimetolose.org.uk and use IOSH’s other free resources:

- a handout with headline information on silica dust – ‘Cut the dust’ is also available in postcard format
- a pocket card for operatives, reminding them when and how silica dust is an issue, and what action to take – ‘Dust down’ is available as a credit-card sized ‘z’ card
- a briefing sheet giving an overview of silica dust and how to control it, aimed at managers or operatives to support a presentation or briefing session.

Click to move to the next slide
Key learning points: This slide lists the key learning points. Explain that there are three key learning points

- What is silica dust?
- Silica dust exposure while at work
- How to prevent exposure to silica dust

Click to bring in each bullet point

- Click to move to the next slide
What is silica dust? This slide has three bullet points. Before you click to reveal them, ask delegates what they think silica dust is.

- Silica is a natural substance found in stone, rocks, sand, clay, bricks, tiles, concrete and some plastic composites.

- When cutting, drilling or dry sweeping-up, silica dust is released as tiny particles, which can be breathed in.

- Silica particles are much smaller than a fine grain of sand.

Support information

Crystalline silica is a natural substance found in stone, rocks, sand and clay, as well as products like bricks, tiles, concrete and some plastic composites. When these materials are worked on, for example by cutting or drilling, the crystalline silica is released as a very fine dust which can be breathed in. This dust is one of the oldest workplace hazards – and it still causes hundreds of thousands of deaths across the world every year.

The minerals quartz, cristobalite and tridymite are crystalline forms of silicon dioxide that are found naturally around the world. Quartz is in most rocks, but most particularly in sandstone and granite – quartz is just yellow sand.
The main focus in workplaces in industrialised economies is on the risk of lung cancer from exposure to respirable crystalline silica, although silicosis and other lung diseases are also a concern where control measures are poor. Silica dust is only harmful when it’s inhaled deep into your lungs where oxygen is taken up into the blood.

Sitting on a sandy beach won’t cause any respiratory harm because any sand particles breathed in will generally be much too big to go beyond your nose or upper airways. But as a very fine airborne dust, silica can be dangerous. It’s the respirable fraction that is hazardous.

Respirable particles are typically less than around 5 micrometers in size. Compare this to the dot in the letter “i” in “grain” on this slide, which is around 200–300 micrometers in diameter, and the finest sand on that beach, which is about 50–70 micrometers.

Individual silica dust particles are so small that they are invisible to the naked eye in normal light – so you can have relatively high airborne concentrations without being aware that the dust is being inhaled.

- Click to move to the next slide
SILICA IS THE SECOND MOST SIGNIFICANT CAUSE OF OCCUPATIONAL CANCER AFTER ASBESTOS

- Click to move to the next slide
Worksafe BC film: This slide includes sound, so please make sure that your computer’s volume is turned up. This video, from Worksafe BC, visually illustrates how the lungs are damaged by silica dust. Play the video, and then ask delegates if they were aware that the silica damages their lungs in this way.

- Click to move to the next slide
Long-term exposure to silica dust can cause silicosis, lung cancer and a number of other serious diseases including chronic obstructive pulmonary diseases such as emphysema.

- Click to move to the next slide
The signs of lung cancer: You should explain to delegates that if any of the following changes in their body happen they should get checked. This slide has seven bullet points and a message to get checked by a doctor. Click to introduce each bullet point.

- A persistent cough you’ve had for more than a few weeks or a change in cough you’ve had for some time
- Coughing up phlegm with spots of blood in it
- Shortness of breath
- A pain in the shoulders and chest that won’t go away
- Appetite loss
- Fatigue
- Sudden or unexpected weight loss

Don’t delay – if you have any of these symptoms, get checked by your GP

Ask delegates: Have they noticed any unusual changes to their body? If so, they should go and get themselves checked by a GP.

- Click to move to the next slide
The straw walk: To give delegates an indication of what it’s like breathing with damaged lungs from diseases such as those caused by cancer, ask them to do the straw walk.

- Make sure everyone who wants to take part is in good health and **no one is asthmatic**.
- Give each person a straw and ask them to walk at least 50 metres and go up and down a flight of stairs.
- When they return, ask them to pinch their noses and breathe through the straw.

Discuss with delegates how they feel.

- Click to move to the next slide
Terry the former stoneworker: This slide includes sound, so please make sure you have access to speakers and that your computer’s volume is turned up. The short film is about Terry who was a stoneworker and was diagnosed with silicosis. It documents the effect that silicosis has on him and his family.

- Click to move to the next slide
People who could be at risk:

This slide introduces people who could be at risk. It gives a brief list of workers who are exposed to silica dust.

Ask delegates if they can think of any other areas of employment that could be exposed to silica dust. The main areas of employment include, but are not limited to:

- abrasive blasting workers, bricklayers, brick, concrete or tile manufacturing operatives, ceramic and pottery workers, coke and other fuel manufacturing operatives, concrete workers, construction labourers, crushing and grinding operators, demolition workers, digger drivers, foundry operatives, furnace workers, glass manufacturing workers, kiln operators, machinery manufacturing operatives, machinists, mineral product manufacturing operators, mining machine operators, moulding and casting operators, operatives working on plastic composite products, quarry workers, rock drillers, sandblasters, steelworkers, stonemasons, tunnel workers, utility employees involved in excavation work, welders, workers grinding, abrading, buffing or polishing.

- Click to move to the next slide
Ask delegates: What can you do to control exposure?

- Click to move to the next slide
Reducing exposure to silica

- Design out the risks – cut down the amount of silica dust produced in the first place, for example by planning in recesses for pipework and wiring in a new building
- Use a safer product
- Use an enclosure or hood to contain the dust and local exhaust ventilation to suck dust away as it’s created
- Fit and use on-tool extraction devices to hand-held tools
- Dampen the work to keep the dust levels lower
- Wear a suitable mask to stop dust getting into your lungs
- Get trained

Reducing exposure to silica: This slide shows what you can do to reduce exposure to silica dust.

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- Use a safer product
- Use an enclosure or hood to contain the dust and local exhaust ventilation to suck dust away as it’s created
- Fit and use on-tool extraction devices to hand-held tools
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Explain to delegates that these are the ways to reduce exposure to silica; you can talk around each point if you like.

Support information:

Silica exposure limits around the world: Legal exposure limits are the maximum allowable concentration in workplace air, averaged over a day. It’s worth remembering that some tasks don’t last long but have very high exposure peaks.
The limit for silica differs from one country to another, but it is generally expressed as an average value over an eight-hour working day. For example:

- in British Columbia and some other provinces in Canada – 0.025 mg/m$^3$
- in Ireland, Italy, Finland and Portugal – 0.05 mg/m$^3$
- in the Netherlands – 0.075 mg/m$^3$
- in Britain – 0.1 mg/m$^3$
- in Poland – 0.3 mg/m$^3$

There is a trend to reduce exposure limits in many countries. In the US, the American Conference of Governmental Industrial Hygienists has recommended a limit of 0.025 mg/m$^3$ and the government’s Occupational Safety and Health Administration has proposed cutting the limit to 0.05 mg/m$^3$. For further information on limit values in Europe visit: [www.nepsi.eu/media/2307/oel_table_dust-qct_may_2010_jan09.pdf](http://www.nepsi.eu/media/2307/oel_table_dust-qct_may_2010_jan09.pdf)

- Click to move on to the next slide
No time to lose

- What have you learned today that has had the biggest impact on you?
- What will you do differently from now on?

**No time to lose:** This slide gives you a chance to review what delegates have learned in the session.

Reveal each of the bullet points in turn and ask delegates to share their answers to these questions with the whole group.

- Click to move to the next slide
Thank you for listening: IOSH’s No Time to Lose campaign focuses on a range of carcinogenic exposures that are caused by work activities. We’re aiming to raise awareness and offer practical support to businesses to help them tackle this significant occupational health issue. Go to www.notimetolose.org.uk to:

- access free information
- download or order free practical resources
- ask our expert panel for advice
- find out about events and CPD opportunities
- support the campaign
- pledge your commitment to tackling harmful exposures at work
- get the latest news on occupational cancer
- read our national action plan.