

Crystalline Silica Dust

Information Sheet

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Crystalline silica is widely found in nature. Occupational exposure to crystalline silica dust occurs in many industries including: quarrying, mining, mineral processing (e.g. drying, grinding, bagging and handling) slate working, stone crushing and dressing, foundry work, brick and tile making, some refractory processes, construction and demolition work, including work with stone, concrete, brick and some insulation boards, tunneling, building restoration, pottery and ceramic industries. Where concrete, stone or sand based materials are used, there is a potential for exposure to crystalline silica dust.



Routes of Exposure

Inhalation is the primary route of exposure to crystalline silica dust. For any kind of dust, there are different particle sizes. When dust is inhaled, its point of deposition within the respiratory system is very much dependent upon the range of particle sizes present in the dust. It is the respirable (smallest particle size) fraction of crystalline silica dust which is of critical concern for its health effects, since these can penetrate deep into the lung.

Relevant Legislation

The respirable fraction of the dust is invisibly fine and the OELV for Respirable Crystalline Silica (RCS) is $0.1\text{mg}/\text{m}^3$ averaged over 8 hours, as set down in the HSA Chemical Agents & Carcinogens Code of Practice. Work involving exposure to respirable

crystalline silica generated by a work process is listed as a carcinogenic process in Schedule 4 of this Code.

A risk assessment under the Safety, Health and Welfare at Work (Carcinogens) Regulations is required where exposure can occur.

The Safety, Health And Welfare At Work (General Application) (Amendment) Regulations 2016 S.I. No. 36 of 2016 contains a prohibition on silica. Regulation 128 - "An employer shall ensure that no sand or other substance containing free silica is introduced as an abrasive into any blasting apparatus".

Health Effects

Inhalation of fine dust containing crystalline silica can cause lung damage (silicosis), which in severe cases can be disabling, or even fatal. Silicosis is irreversible and treatment options are limited.



Workers may develop any of three types of silicosis, depending on the concentration of airborne silica:

- Chronic silicosis, which usually occurs after ten or more years of exposure to crystalline silica at relatively low concentrations.
- Accelerated silicosis, which results from exposure to high concentrations of crystalline silica and develops five to ten years after the initial exposure.
- Acute silicosis, which occurs where exposure concentrations are the highest and can cause symptoms to develop within a few weeks to four or five years after the initial exposure.

Workers exposed to RCS are at increased risk of developing lung cancer.

Recommended Control Measures

- The first step to controlling any identified chemical hazard such as crystalline silica is to carry out a Risk Assessment.
- Seek to substitute the silica containing material with a suitable alternative if possible.
- Use safe systems of work such as wet methods for dust removal/suppression.
- Engineering controls such as Local Exhaust Ventilation (LEV) or containment measures should be used where appropriate.
- Wear suitable PPE such as coveralls and appropriate gloves.
- Respiratory Protective Equipment (RPE) should either be a FFP3 disposable respirator or a P3 particulate filter fitted to a half or full face mask to provide effective protection and be CE marked. All RPE should fit the employee correctly.
- Any RPE worn should be properly fit tested.

Health Advice

There are preventative measures that can be taken by the employee or the employer.

- Make respiratory health surveillance available for all relevant employees, e.g. lung function tests.
- It is important to seek medical advice if there are persistent symptoms and report these to your employer.

Key Points

Always assume that exposure is likely to occur and protect according to the level of risk identified from risk assessment.

- ✓ Prepare written risk assessments (required by law) highlighting the key hazards, risks and controls in place.
- ✓ Use safe systems of work to reduce exposure based on the risk assessment.
- ✓ Use dust suppression techniques during work.
- ✓ Use engineering controls such as local exhaust ventilation to control exposure.
- ✓ Use and store personal protective equipment according to instructions to reduce exposure.

Further information:

- See EU guidance (2016) on RCS at <https://osha.europa.eu/en/guidance-national-labour-inspectors-on-addressing-risks-from-worker-exposure-to-respirable-crystalline-silica>
- Other useful resources on RCS can be found at www.breathefreely.org.uk and www.notimetolose.org.uk

Further Information and Guidance:

Visit our website at www.hsa.ie, telephone our contact centre on **0818 289 389** or email contactus@hsa.ie

Use BeSMART, our free online risk assessment tool at www.besmart.ie

Check out our range of free online courses at www.hsalearning.ie

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