

# QY3

## COSHH essentials in quarries: Silica



The Control of Substances Hazardous to Health Regulations 2002 (COSHH) require employers to ensure that exposure is prevented or, where this

is not reasonably practicable, adequately controlled. This guidance gives practical advice on how this can be achieved by applying the principles of good practice for the control of exposure to substances hazardous to health, as required by COSHH.

It is aimed at people whose responsibilities include the management of substances hazardous to health at work (eg occupational health specialists, anyone undertaking COSHH assessments, supervisors and is also useful for trade union and employee safety representatives). It will help you carry out COSHH assessments, review existing assessments, deliver training and supervise activities involving substances hazardous to health.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

See Essential information near the end of the sheet.

# Crushing

## Control approach 2 Engineering control

### What this sheet covers?

This sheet describes good control practice when carrying out crushing.

It covers the key points you need to follow to help reduce exposure to an adequate level.

Follow all the points, or use equally effective measures.

### Main points

- High dust levels result from crushing.
- Breathing in dust may cause silicosis.
- Keep the emission sources as small as possible
- Use all the controls in this sheet, make sure the controls work.
- Use air sampling. See sheet G409.
- Health surveillance is usually needed. See sheets G401 and G404.

### Hazards

- Respirable crystalline silica (RCS) is also known as alpha-quartz, cristobalite or 'free silica', and can be wrongly labelled as 'amorphous silica'.
- RCS is hazardous by inhalation as the 'respirable' dust, which is very fine and invisible under normal lighting, can get deep into the lungs. The workplace exposure limit (WEL) for RCS is 0.1 mg/m<sup>3</sup> (based on an 8-hour time-weighted average).
- Inhaling RCS can lead to:
  - Silicosis – a serious and irreversible lung disease that can cause permanent disablement and early death. There is an increased risk of lung cancer in workers who have silicosis.
  - Chronic obstructive pulmonary disease (COPD) – a group of lung diseases, including bronchitis, and emphysema. The risk of COPD is increased by smoking.
- RCS dust is also abrasive and drying when in contact with skin, and can lead to contact dermatitis.

### Access to work area

- ✓ Allow access to authorised and appropriately trained people only.

### Equipment and Procedures

- ✓ Control the airborne contaminants using:
  - segregation;
  - water suppression;

- local exhaust ventilation (LEV) for crushers located indoors.
- ✓ Use equipment which is designed to resist the abrasive effects of silica-containing materials.
- ✓ If possible, locate the crusher outdoors, away from occupied buildings. Crushers located indoors need a high rate of ventilation.
- ✓ Segregate the operator in a ventilated control cabin.
- ✓ Consult the manufacturer or a qualified ventilation engineer to ensure that the design will cope with the anticipated dust levels. The design should cover the following points:
  - Use an enclosed, ventilated cabin fitted with filtered air intakes.
  - Use pre-filters and high efficiency particulate filters (class H to current British Standards) on the air intakes to stop dust getting into the cabin. Consider purpose-designed or appropriate retro-fit filters.
  - Ensure the cabin door and windows are closed at all times to keep dust out.
  - Use CCTV or suitable systems to prevent the need for the operator to leave the cabin.
  - Clean the cabin regularly – at least once a week. Use vacuum equipment that meets at least the dust Class M (medium hazard) classification.
  - Ensure the ventilated cabin is sealed tight by keeping door and window seals in good condition.
  - Fit an indicator or alarm to show if filters have blocked or failed.
- ✓ Use equipment with integral water suppression.
- ✓ Ensure water supplies are adequate, and protect against ice formation in cold weather.
- ✓ For crushers located indoors, enclose the plant as much as possible and install LEV at openings.
- ✓ Provide an easy way of checking the LEV is working, eg airflow indicator or equivalent.
- ✓ Airflow must be sufficient to control airborne contaminants effectively. This will depend on the design, size of opening and the type of process and substance being controlled.
- ✓ Have a supply of clean air coming into the workroom to replace extracted air.
- ✓ Shake down air filters regularly (eg every hour), or use automated reverse-jet cleaning.

### Respiratory protective equipment (RPE)

- RPE is normally not needed.
- RPE may be needed for maintenance and cleaning or when entering dusty areas on exiting the cabin.

### Personal protective equipment (PPE)

- ✓ Ask your supplier to advise on suitable PPE.
- ✓ Provide separate storage for clean and contaminated PPE.
- ✓ Warn workers that dusty PPE can be a source of secondary exposure.
- Provide coveralls that do not retain dust – synthetic rather than cotton.
- Provide protective gloves suitable for working with RCS.
- Use a contract laundry or a suitable equivalent to wash work clothing. Don't allow workers to do this at home; warn them that the dust contains silica.

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## Personal decontamination and skin care

- Provide warm water, mild skin cleansers, and soft paper or fabric towels for drying. Avoid abrasive cleansers.
- Provide pre-work skin creams, which will make it easier to wash dirt from the skin.
- Provide after-work creams to replenish skin oils.

## Maintenance, examination and testing

### *Control cabin and water suppression*

- ✓ Follow instructions in maintenance manuals – keep equipment in effective and efficient working order.
- ✓ Check for signs of damage daily. Make repairs.
- ✓ Review records – failure patterns show where preventive maintenance is needed.
- ✓ Minerals and silica-containing dusts are very abrasive; plan regular checks and maintenance of critical parts.
- ✓ Check pre-filters regularly – keep spares.
- ✓ Check that the filter seating is in good condition.
- ✓ Change inlet air filters as advised by the manufacturer.
- ✓ Get a competent engineer to examine the air filtration regularly.

### *LEV*

- ✓ For LEV a user manual or log book is helpful in setting out the frequency of checking, maintenance or parts replacement.
- ✓ For LEV with no user manual or log book, you may need the help of a competent person. They can determine the performance needed for adequate control.
- ✓ Keep records of all examinations for at least 5 years.
- ✓ LEV systems require a statutory 'thorough examination and test' (TE<sub>XT</sub>).
- ✓ Get a competent person to perform the TE<sub>XT</sub> at least once every 14 months.
- ✓ Carry out all actions arising from the TE<sub>XT</sub>.
- ✓ Several measures are available to check effectiveness of controls ranging from simple qualitative (use of dust lamp) to complex quantitative techniques (eg air sampling) usually for higher risk scenarios.
- ✓ HSG258 provides more detailed information on LEV systems and legal and competence requirements.

## Cleaning and housekeeping

- ✓ Clean the control cabin at least once a week. Fine dust on internal surfaces suggests poor control.
- ✓ Damp down and clean carefully to avoid stirring up dust. Provide RPE.
- ✓ Clean work equipment and the work area daily. Clean other equipment regularly – at least once a week.
- ✓ Vacuum dry dust or use wet cleaning methods.
- ✓ Use vacuum equipment that meets at least dust class M (medium hazard) classification to remove dust.

**Caution:** Never allow the use of brushes or compressed air for removing dust from skin and clothing. Avoid the use of brushes or compressed air for removing dust from surfaces or from inside machinery.



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### Health surveillance

- Provide health surveillance for COPD where there is a reasonable likelihood that COPD may occur in your workplace. See G401.
- Provide health surveillance for dermatitis where there is a reasonable likelihood that dermatitis may occur in your workplace. See G403.
- Provide health surveillance for silicosis where there is a reasonable likelihood that silicosis may occur in your workplace. See G404.

### Training and supervision

- ✓ Provide supervision – ensure that safe work procedures are followed.
- ✓ Tell workers about the hazards associated with their work and how to recognise early signs of lung damage from exposure to RCS.
- ✓ Provide workers with training on:
  - working safely with hazardous substances;
  - when and how to use controls;
  - how to check they are working;
  - what to do if something goes wrong.
- ✓ Involve managers and supervisors in health and safety training.
- ✓ Training records are helpful to demonstrate training has taken place.

### Essential information

You can find the full COSHH essentials series at [www.hse.gov.uk/coshh/essentials/](http://www.hse.gov.uk/coshh/essentials/)

Health surveillance, monitoring and sampling sheets are available at [www.hse.gov.uk/pubns/guidance/gseries.htm](http://www.hse.gov.uk/pubns/guidance/gseries.htm)

*Health surveillance for chronic obstructive pulmonary disease (COPD)*

COSHH Guidance Sheet G401 HSE 2016

[www.hse.gov.uk/pubns/guidance/g401.pdf](http://www.hse.gov.uk/pubns/guidance/g401.pdf)

*Health surveillance for occupational dermatitis* COSHH Guidance Sheet

G403 HSE 2011 [www.hse.gov.uk/pubns/guidance/g403.pdf](http://www.hse.gov.uk/pubns/guidance/g403.pdf)

*Health surveillance for silicosis* COSHH Guidance Sheet G404 HSE Books

2016 [www.hse.gov.uk/pubns/guidance/g404.pdf](http://www.hse.gov.uk/pubns/guidance/g404.pdf)

*New and existing engineering control systems* COSHH Guidance Sheet

G406 HSE Books 2016 [www.hse.gov.uk/pubns/guidance/g406.pdf](http://www.hse.gov.uk/pubns/guidance/g406.pdf)

*Exposure measurement: Air sampling* COSHH Guidance Sheet G409

HSE Books 2016 [www.hse.gov.uk/pubns/guidance/g409.pdf](http://www.hse.gov.uk/pubns/guidance/g409.pdf)

General storage of solids and liquids COSHH Guidance Sheet G101

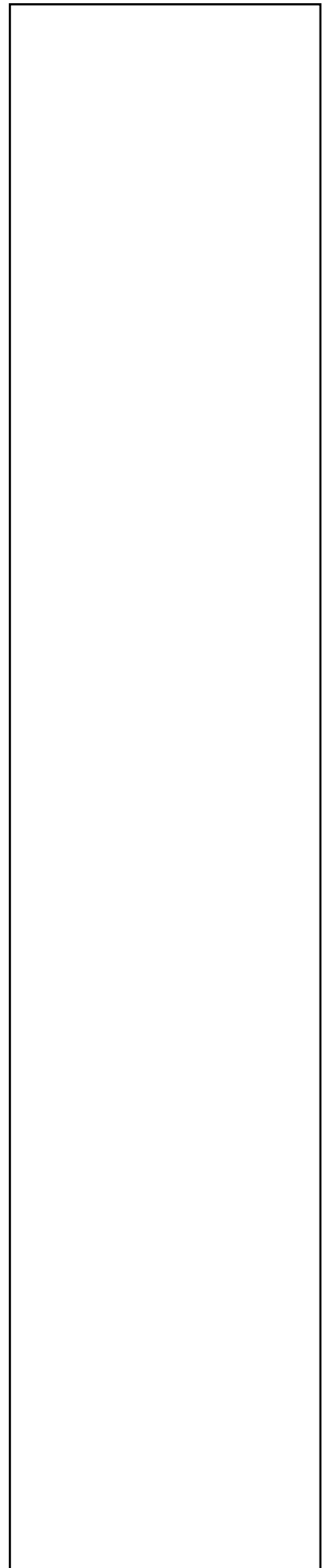
HSE 2015 [www.hse.gov.uk/pubns/guidance/g101.pdf](http://www.hse.gov.uk/pubns/guidance/g101.pdf)

General advice on chemicals causing harm via skin or eye contact COSHH Guidance Sheet S100 HSE 2015

[www.hse.gov.uk/pubns/guidance/s100.pdf](http://www.hse.gov.uk/pubns/guidance/s100.pdf)

Selecting personal protective equipment (PPE) COSHH Guidance Sheet

S102 HSE 2015 [www.hse.gov.uk/pubns/guidance/s102.pdf](http://www.hse.gov.uk/pubns/guidance/s102.pdf)



Advice for managers COSHH Guidance Sheet QY0 HSE 2006  
[www.hse.gov.uk/pubns/guidance/qy0.pdf](http://www.hse.gov.uk/pubns/guidance/qy0.pdf) contains a table showing RCS concentrations in common materials

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[www.hse.gov.uk/coshh/essentials/](http://www.hse.gov.uk/coshh/essentials/)

Health surveillance, monitoring and sampling sheets are available at [www.hse.gov.uk/pubns/guidance/gseries.htm](http://www.hse.gov.uk/pubns/guidance/gseries.htm)

### Further Information

Occupational Safety and Health Consultants Register [www.oshcr.org/](http://www.oshcr.org/)

Institute of Local Exhaust Ventilation Engineers  
[www.cibse.org/Institute-of-Local-Exhaust-Ventilation-Engineers-I](http://www.cibse.org/Institute-of-Local-Exhaust-Ventilation-Engineers-I)

Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV) HSG258 HSE Books 2011  
[www.hse.gov.uk/pubns/books/hsg258.htm](http://www.hse.gov.uk/pubns/books/hsg258.htm)

HSE's LEV web page: [www.hse.gov.uk/lev/](http://www.hse.gov.uk/lev/)

Clearing the air: A simple guide to buying and using local exhaust ventilation (LEV) Leaflet INDG408 HSE 2008  
[www.hse.gov.uk/pubns/indg408.htm](http://www.hse.gov.uk/pubns/indg408.htm)

### Employee checklist

- Keep the cabin interior clean.
- Check for signs of leaks, wear and damage every day including to the door and window seals.
- If you find any problems, tell your supervisor. Don't just carry on working.
- Confirm that the water suppression is turned on and working.
- Use, maintain and store your PPE in accordance with instructions.
- Clean your work boots before entering the cabin.
- Close cabin doors and windows.
- Switch on and check the cabin ventilation system before starting work.
- Wear RPE when leaving the cabin and entering dusty areas.
- Shower and change clothing before leaving the site.
- Co-operate with health surveillance.
- If you develop any ill health symptoms that may be related to work, inform your supervisor.

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