

QY4

COSHH essentials in quarries: Silica



This information will help employers (including the self-employed) comply with the Control of Substances Hazardous to Health

Regulations 2002 (COSHH), as amended, to control exposure to respirable crystalline silica (RCS) and protect workers' health.

It is useful for trade union safety representatives and helps with the Quarries Regulations 1999.

This sheet describes good practice using engineering control - dust extraction and a filtered air supply to the control cabin.

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

It is important to follow all the points, or use equally effective measures.

Main points

- High dust levels result from mineral tumbling over itself.
- Breathing in dust may cause silicosis.
- Keep the emission sources as small as possible.
- Keep exposure as low as possible using all the controls in this sheet. Make sure the controls work.
- You need air sampling. See sheet G409.
- Health surveillance is usually needed. See sheet G404.

Drying and cooling

Control approach 2 Engineering control

Hazard

- ✓ Quarry work can produce airborne respirable crystalline silica (RCS).
- ✓ All RCS is hazardous, causing silicosis. This is a serious lung disease causing permanent disability and early death.
- ✓ Silicosis is made worse by smoking.
- ✓ 'Respirable' means that the dust can get to the deepest parts of the lung. Such fine dust is invisible under normal lighting.
- ✓ When all controls are applied properly, less than 0.1 mg/m³ RCS is usually achievable (based on an 8-hour time-weighted average).

Crystalline silica concentrations in common materials

- ✓ See table in sheet QY0.

Access and premises

- ✓ Only allow access to authorised staff.
- ✓ Use CCTV to monitor the process - reduce the need for people to be there.

Equipment

- ✓ Design equipment to resist the abrasive effects of silica-containing materials.
- ✓ Segregate the operator in a control cabin. See sheet QY11. Provide HEPA filtered air to the control cabin.
- ✓ Use CCTV to monitor the process.
- ✓ Enclose the plant as much as possible.
- ✓ Drying creates large amounts of dust. Conveying and silo storage also create dust.
- ✓ Indoor rotary dryers and coolers need forced ventilation to dilute and remove dusty air.
- ✓ Ensure outdoor dryers and coolers are weather-resistant.
- ✓ Install dust extraction at openings. Don't simply return extracted dust to the dried product.
- ✓ Always minimise the distance that dried product needs to fall.
- ✓ Ensure an inward air speed of at least 1 metre per second into the dryer and cooler.
- ✓ Fit a manometer or pressure gauge near the extraction point, to show that the system is working properly.
- ✓ Mark the acceptable range of readings.

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- ✓ With multiple extraction points, a simplified pressure check method may suffice.
 - ✓ Consult a qualified ventilation engineer to design new control systems or to update current controls. See sheet G406.

Procedures

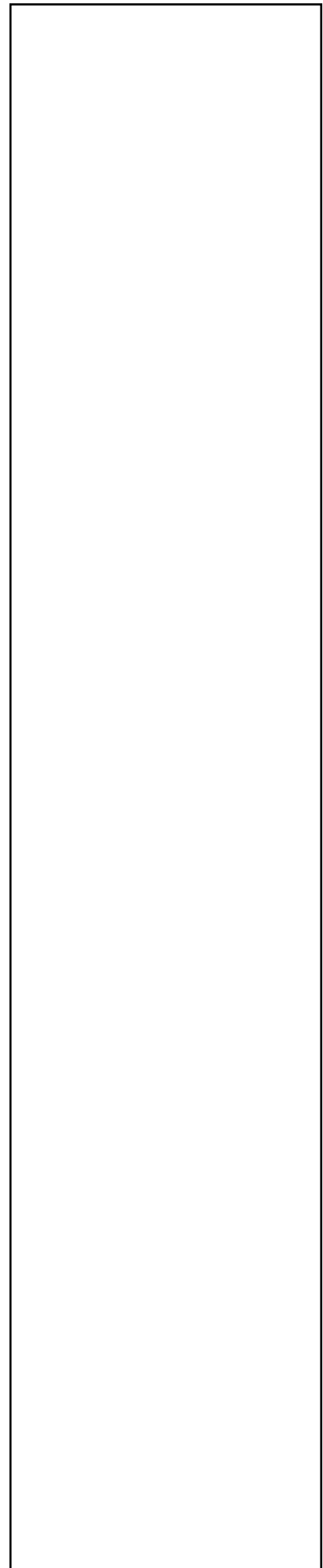
- ✓ Always confirm that the dust extraction and control cabin air supply is turned on and working before starting work.
- ✓ Keep doors and windows closed while working.
- ✓ Shake down air filters regularly (eg every hour), or use automated reverse-jet cleaning.

Maintenance, examination and testing

- ✓ Minerals and silica-containing dusts are very abrasive. Plan regular maintenance.
- ✓ Use a written system of work - define what personal protective equipment (PPE) is needed for maintenance.
- ✓ Follow instructions in maintenance manuals - keep equipment in effective and efficient working order.
- ✓ For control cabins and cabs, see sheet QY11.
- ✓ Daily, look for signs of damage, eg to ducts and seals. Make repairs.
- ✓ Check that filter seatings are in good condition.
- ✓ At least once a week, check that the cabin is dust-tight and the dust extraction system and gauges work properly.
- ✓ Change inlet air HEPA filters after 250 hours' use, or as advised by the manufacturer.
- ✓ You need to keep all controls in good working order. See sheet G406 for advice on engineering controls.
- ✓ You need to know the manufacturer's specifications to check the extraction's performance.
- ✓ If this information isn't available, hire a competent ventilation engineer to determine the performance needed for effective control.
- ✓ The engineer's report must show the target extraction rates.
- ✓ Keep this information in your testing log-book.
- ✓ Get a competent ventilation engineer to examine the extraction thoroughly and test its performance at least once every 14 months. See the HSE publication HSG54 - see 'Further information'.
- ✓ Keep records of all examinations and tests for at least five years.
- ✓ Review records - failure patterns show where preventive maintenance is needed.
- ✓ Carry out air sampling to check that the controls are working well. See sheet G409.

Personal protective equipment (PPE)

- ✓ Ask your supplier to help you select the right PPE.
- ✓ Provide storage for clean and contaminated PPE.



Respiratory protective equipment (RPE)

- ✓ RPE should not be needed if the controls work properly.
- ✓ RPE is often needed for work near the equipment while running, and for maintenance and cleaning jobs.
- ✓ Powered or air-fed RPE is more comfortable to wear.
- ✓ Select RPE that suits the wearer, the job and the work environment.
- ✓ Decide the level of protection from air sampling data. Otherwise, use RPE with an assigned protection factor (APF) of at least 40. See sheets R4 and R5.
- ✓ Make sure all RPE is properly fit-tested - get advice from your supplier.
- ✓ Make sure that workers check their RPE works properly before use.
- ✓ Replace RPE filters as recommended by the supplier.
- ✓ Keep RPE clean.

Other protective equipment

- ✓ Provide clean, dust-resistant coveralls.
Caution: Never allow use of compressed air for removing dust from clothing.

Health surveillance

- ✓ You need health surveillance unless exposure to RCS is well below the limit. See sheet G404.
- ✓ Consult an occupational health professional - see 'Useful links'.

Cleaning and housekeeping

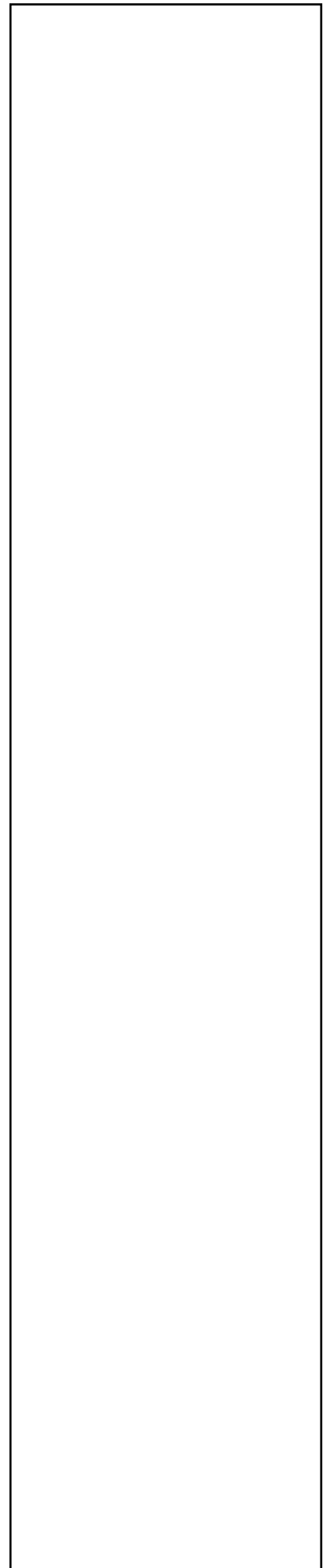
- ✓ See sheet QY11 for cabins and cabs.
- ✓ Clean the control cabin at least once a week. Fine dust on internal surfaces suggests poor control.
- ✓ Clean the machinery and workroom at least once a week.
- ✓ Use a Type H vacuum cleaner fitted with a HEPA filter, or wet clean.
Caution: Don't use a brush or compressed air.

Training and supervision

- ✓ Tell workers that silica dust can cause serious lung diseases.
- ✓ Working in the right way and using the controls correctly is important for exposure control. Train and supervise workers. See sheet QY0.

Further information

- *General ventilation in the workplace: Guidance for employers*
HSG202 HSE Books 2000 ISBN 0 7176 1793 9
- *Maintenance, examination and testing of local exhaust ventilation*
HSG54 (Second edition) HSE Books 1998 ISBN 0 7176 1485 9
- *Respiratory protective equipment at work: A practical guide*
HSG53 (Third edition) HSE Books 2005 ISBN 0 7176 2904 X
- *Control of respirable crystalline silica in quarries* HSG73 HSE Books 1992 ISBN 0 11 885680 4
- For environmental guidelines see sheet QY0



Useful links

- Your Trade Association may advise on health and safety consultants and training providers.
- HSE priced and free publications are available from HSE Books
Tel: 01787 881165 Website: www.hsebooks.co.uk.
- HSE free leaflets can be downloaded from HSE's website:
www.hse.gov.uk/pubns.
- For information about health and safety ring HSE's Infoline Tel: 0845 345 0055 Textphone: 0845 408 9577 e-mail: hse.infoline@natbrit.com.
- Contact the British Occupational Hygiene Society (BOHS) on 01332 298101 or at www.bohs.org for lists of qualified hygienists who can help you.
- Look in the Yellow Pages under 'Health and safety consultants' and 'Health authorities and services' for 'occupational health'.
- Also see www.nhsplus.nhs.uk.

Employee checklist

- Are you sure how to use all dust controls?
- Is the equipment switched off and locked off for maintenance and cleaning?
- Is the control cabin clean air supply working?
- Keep the cabin interior clean.
- Is the dust extraction working? Check the gauge.
- Look for signs of leaks, wear and damage every day.
- If you find any problems, tell your supervisor. Don't just carry on working.
- Clear up dust spills promptly.
- Make suggestions to improve the effectiveness of dust control.
- Co-operate with health surveillance.
- Use, maintain and store your protective equipment in accordance with instructions.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory 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 as illustrating good practice.