

QY9

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 respiratory protective equipment (RPE) and dust extraction.

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

- Extraction must be strong enough to collect the very dusty air that is displaced when filling, moving and palletising bags.
- Bags also get coated with dust. This is another exposure source.
- Breathing in dust may cause silicosis.
- 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.

Mineral powders: Small bag (15-50 kg) filling and transfer

Control approach R RPE

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.

Equipment

- ✓ Design equipment to resist the abrasive effects of silica-containing materials.
- ✓ Leave powders to settle and compact inside the silo before bagging.
- ✓ Could you persuade customers to accept bulk delivery?
- ✓ Can you use an automated carousel bagging system with screw-feed to fill bags slowly?
- ✓ Wire in the extraction with the booth lighting.
- ✓ Use plastic curtains or other suitable dividing material to enclose the bag transfer area.
- ✓ Respiratory protective equipment (RPE) is normally needed to reduce exposures to an acceptable level.
- ✓ Wear RPE for work at and near sack filling and handling.
- ✓ Enclose the filling point as much as possible, with extraction to capture dust as bags fill and on removing bags from the filling nozzle.
- ✓ Use good quality bags to reduce leakage through seams.
- ✓ Clamp the bag securely to bagging head during filling.
- ✓ Control the filling rate so that extraction continues to be effective.
- ✓ Ensure an inward air speed of at least 1 metre per second at the extraction face.
- ✓ Fit a manometer or pressure gauge near the extraction point, to show that the system is working properly.
- ✓ Mark the acceptable range of readings.

-
- ✓ Discharge cleaned, extracted air to a safe place outside, away from doors, windows and air inlets.
 - ✓ Have a supply of clean air coming into the workroom to replace extracted air.
 - ✓ Fit an indicator or alarm to show if filters have blocked or failed.
 - ✓ Consult a qualified ventilation engineer to design new control systems or to update current controls. See sheet G406.

Storage

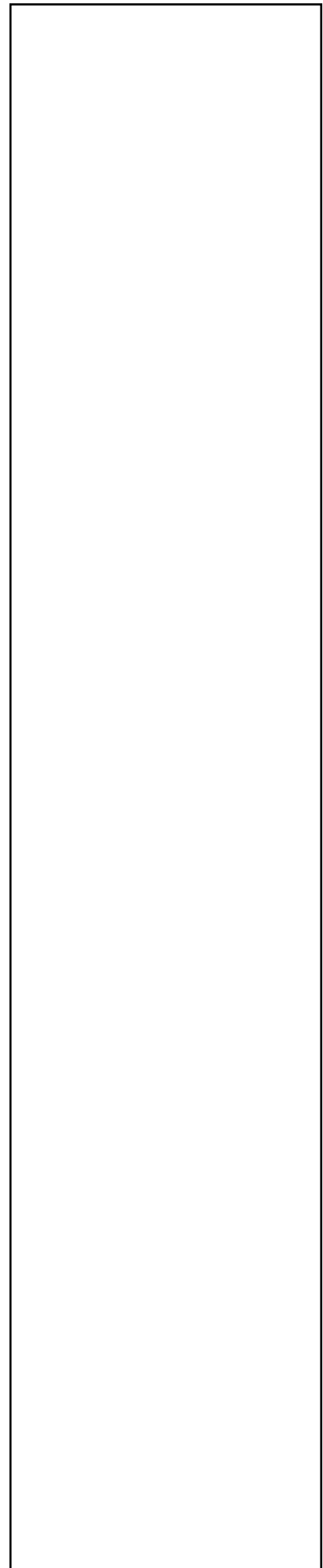
- ✓ Define the areas for storage and put up clear signs.
- ✓ Make sure spills can be contained and cleaned up without raising dust.
- ✓ Paper sacks are often contaminated with dust on the outside, which is disturbed by handling. Use RPE for sack handling.

Procedures

- ✓ Always confirm that the dust extraction is turned on and working before starting work.
- ✓ Make sure that workers check that their RPE works properly every time they put it on.
- ✓ Shake down air filters regularly (eg every hour), or use automated reverse-jet cleaning.
- ✓ Make sure you can get spares easily.

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.
- ✓ Maintain all respiratory protective equipment (RPE) in effective and efficient working order.
- ✓ Keep airline oil and water traps empty, and filters clean.
- ✓ Daily, look for signs of damage. Make repairs.
- ✓ Check that filter seatings are in good condition.
- ✓ 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 is normally needed.
- ✓ 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.
- ✓ Train workers to 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

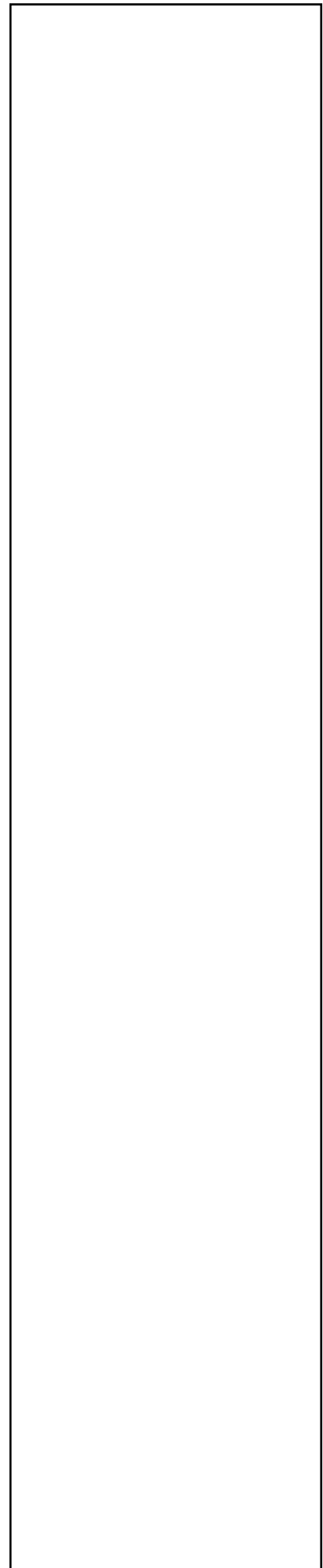
- ✓ Every day, clear up accumulated waste.
- ✓ Provide an extracted hopper for burst or damaged bags.
- ✓ Store empty bags outside the workroom. Dispose of wastes safely.
- ✓ Damp down and shovel large amounts carefully to avoid stirring up dust. Provide RPE.
- ✓ Clean the machinery and workroom at least 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

- *Dust control in powder handling and weighing: A revised COSHH guide* Guidance HSE Books 1997 ISBN 0 7176 1370 4
- *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?
- Check your RPE works properly every time you use it.
- Is the dust extraction working? Check the gauge.
- Clean air pre-filters daily, or follow the manufacturer's advice.
- Check the silica content of the material being bagged.
- Look for signs of leaks, wear and damage every day.
- Don't use faulty bags, eg with valve defects.
- 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.