

ST3

COSHH essentials for stone workers: Silica

Cutting and polishing using hand-held rotary tools

Control approach 2 Engineering control and Respiratory protective equipment (RPE)

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

What this sheet covers

This sheet describes good control practice for Respirable Crystalline Silica (RCS) dust from the cutting and polishing of stone using hand-held rotary tools. Working stone using automated rotary tools is covered in Sheet ST2.

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

Follow all the points, or use equally effective measures.

Main points

- Cutting and polishing stone using rotary tools can create high levels of dust containing RCS.
- The content of RCS in the dust depends on the crystalline silica content present in the stone (see sheet ST0).
- On-tool accessories for water suppression or extraction may be suitable for tasks and locations where fixed extraction and water suppression systems are not appropriate.
- Contaminated work clothing may also be a source of dust exposure.
- Air sampling may be needed to show that control of exposure to RCS is being maintained.
- Provide health surveillance when workers are regularly exposed to RCS dust and there is a reasonable likelihood that silicosis may develop.
- Consider other risks of ill-health from cutting and polishing stone, including risk of hand-arm vibration syndrome.

Hazards

- ✓ 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 (for RCS is detailed in HSE publication EH40/2005 Workplace Exposure Limits: www.hse.gov.uk/pubns/priced/eh40.pdf).
- ✓ Inhaling RCS can lead to:
 - Silicosis which is 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) which is a group of lung diseases, including bronchitis and emphysema, that results in severe breathlessness, prolonged coughing, chronic disability and can lead to death. 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.

- ✓ Dried slurry can, if disturbed, produce airborne dust which may be hazardous by inhalation.

Access to work area

- ✓ Allow access to authorised and appropriately trained people only.
- ✓ Segregate this task as far as possible to reduce spreading of airborne contamination to other workers.
- ✓ Where possible slope floors gently towards gulleys to help dust removal by wet washing.
- ✓ Gulleys should not flow through clean areas, as there is a risk of the slurry drying out and dust becoming airborne.

Equipment and procedures

- ✓ Consider whether it is reasonably practicable to use a water suppression system for the task being undertaken.
- ✓ If water suppression is inappropriate, use an extracted booth, eg. down-draught, cross-draught or water-backed.
- ✓ Ensure that the airflow across the booth is adequate to capture and contain the stone dust generated.
- ✓ Avoid the use of capturing hoods where they are likely to be inadequate for capturing the multi-directional and high energy dust generated by cutting and polishing.
- ✓ Place the stone work on an open-framed rotating banker to minimise obstruction to the airflow across the booth.
- ✓ Make sure workers:

- Position themselves to not obstruct the airflow when working in a booth.
- Direct the jet of dust towards the extraction system.

- ✓ Check pre-filters daily, or follow manufacturer's advice.

- ✓ Have a clean supply of air coming into the workroom to replace extracted air.

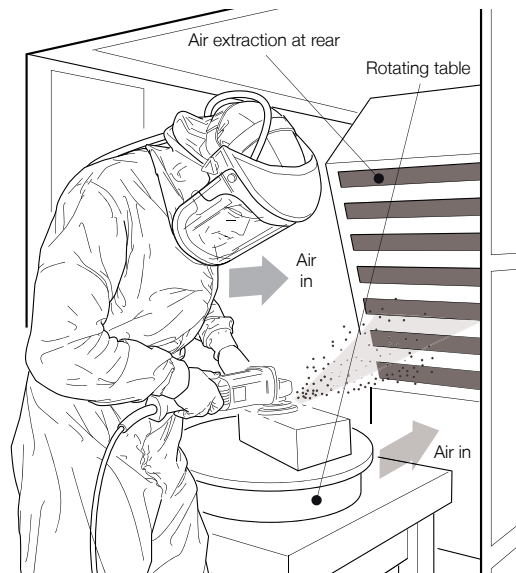
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

- ✓ Only use a recirculating local exhaust ventilation (LEV) system if the air is thoroughly cleaned before its return to the workroom. Under these circumstances, the system should have continuous monitoring (eg. a pressure gauge) and alarms or indicators (eg. for a blocked or failed filter).

- ✓ Provide an easy way of checking the LEV is working, eg. airflow indicator or equivalent.

- ✓ Fit an indicator or alarm to show if filters have blocked or failed.

- ✓ Always confirm that the extraction is turned on and working at the start of work. Check the gauge.



For on-site tasks

- ✓ When reasonably practicable:
 - Use water suppression
 - Work with rotary tools that have on-tool controls for either water suppression or extraction
 - Set up a temporary enclosure or segregated area with extraction.
- ✓ When using water suppression, check that there is adequate water for any dust suppression.
- ✓ Check that the water suppression system works properly before use. If faulty, stop work until it is repaired, or other equally effective control measures can be implemented.
- ✓ Make sure the water suppression is positioned and used correctly.
- ✓ If using on-tool extraction, check that all system components are compatible and suitable for the task.
- ✓ Where reasonably practicable, use an on-tool extraction system with an extraction hood, a Class M or greater extraction unit, the correct hoses/connections fitted to prevent leaks, and spare waste collection bags if needed.
- ✓ Check that the electricity supply is safe, and all hoses and cabling positioned to limit trip risks.
- ✓ Ensure that the air flow is adequate to capture and contain the dust.
- ✓ If equipment is hired then check that the thorough examination and test (TEXT) has been carried out - the hire company, as the owner, has the responsibility to ensure that the TEXT has been completed.
- ✓ Make sure waste collection bags get emptied regularly.

Respiratory protective equipment (RPE)

- ✓ Provide RPE with an assigned protection factor (APF) of at least 40 (see sheets R4 and R5) unless air sampling data show that a lower level of protection is adequate.
- ✓ RPE may be needed for maintenance and cleaning.
- ✓ Fit testing is required for RPE with a tight-fitting face seal.
- ✓ Workers wearing tight-fitting RPE must be clean shaven and trained how to fit it properly and look after it.
- ✓ Change the filters on respirators in accordance with manufacturer's recommendations and if:
 - The shelf-life expiry date has passed
 - They are damaged or visibly contaminated
 - They become harder to breathe through.
- ✓ Air supplied to breathing apparatus should meet minimum quality requirements, in line with the latest British standard.
- ✓ Make suitable arrangements for maintenance, storage and replacement of RPE.
- ✓ Train workers to use RPE properly and look after it.
- ✓ Tell workers to check RPE is working properly before every use.
- ✓ Examine and test non-disposable RPE thoroughly at least once every month and record this.

Personal protective equipment (PPE)

- ✓ Ask your supplier to advise on suitable PPE.
- ✓ Provide storage for PPE to prevent damage or contamination when not in use.
- ✓ 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.
- ✓ Provide coveralls that do not retain dust – synthetic rather than cotton.
- ✓ Provide protective gloves suitable for contact with crystalline silica.

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.

Caution: 'Barrier creams' are not 'liquid gloves' and they do not provide a full barrier.

Maintenance, examination and testing

- ✓ Minerals and silica-containing dusts are very abrasive. Plan regular maintenance.
- ✓ Keep all equipment used for the task in effective working order. Maintain it as advised by the supplier or installer.
- ✓ Clean down the equipment before starting maintenance – use wet or dustless methods.
- ✓ Keep all equipment used for the task in effective working order. Maintain it as advised by the supplier or installer.
- ✓ Check for signs of damage to control equipment before starting work.
- ✓ Have equipment thoroughly examined and tested against its performance standard, at suitable intervals.
- ✓ 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.
- ✓ LEV systems require a statutory 'thorough examination and test' (TEXT).
- ✓ Get a competent person to perform the TEXT at least once every 14 months.
- ✓ Carry out all actions arising from the TEXT.
- ✓ Keep an employer record for at least 5 years of TEXT information, such as target extraction rates which show the LEV is performing as originally intended.
- ✓ Several measures are available to check effectiveness of controls. These range from simple qualitative (eg. use of a 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 down the enclosure and equipment as soon as possible after use.
- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom 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.
- ✓ Clear up sludge and dispose of it safely.
- ✓ For good practices for cleaning up dust on-site, refer to the COSHH Essentials sheet CN5.

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.

Health surveillance

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

Training and supervision

- ✓ 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 operating the equipment and using the control measures correctly, and to report any faults immediately.
- ✓ Provide supervision – ensure that safe work procedures are followed.
- ✓ Involve managers and supervisors in health and safety training.
- ✓ Training records are helpful to demonstrate training has taken place.

Essential Information

G401 – Health monitoring for chronic obstructive pulmonary disease.

G403 – Health surveillance for occupational contact dermatitis (OCD).

G404 – Health surveillance for silicosis.

G406 – New and existing engineering control systems.

G409 – Exposure measurement: Air sampling.

R4 – Respiratory protective equipment (RPE), UK Standard Assigned Protection Factor 40 (APF 40).

R5 – Breathing apparatus with UK Standard Assigned Protection Factor 50 (APF 50).

ST0 – Advice for managers.

ST2 – Automated boring and polishing using rotary tools.

CN5 – Small scale clearing of rubble, dust and debris.

Employee checklist

- Are you sure about safe work procedures?
- Is the equipment in good condition and working properly?
- Is the water suppression working?
- Look for signs of leaks, wear and damage before every job.
- If you find any problems, tell your supervisor. Don't just carry on working.
- Make suggestions to improve the effectiveness of control.
- Co-operate with health surveillance.
- Use, maintain and store your PPE in accordance with instructions.
- Wash hands before eating, drinking, smoking, using the lavatory and after work.

Further information

You can find the full COSHH essentials series at www.hse.gov.uk/coshh/index.htm

Occupational Safety and Health Consultants Register at <http://www.oshcr.org/>

Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV), HSG258, <http://www.hse.gov.uk/pubns/books/hsg258.htm>

Information on on-tool extraction can be found on the Health and Safety Executive website at:

<http://www.hse.gov.uk/lev/haqs.htm>

in CIS69 at <http://www.hse.gov.uk/pubn/cis69.htm>

Respiratory protective equipment at work – A practical guide, HSG53, <http://www.hse.gov.uk/pubns/books/hsg53.htm>

G-series: General Guidance COSHH Essentials sheets at <http://www.hse.gov.uk/pubns/guidance/gseries.htm>

Information on health and safety for stone working in the stone manufacturing and construction industries can be obtained from:

The Health and Safety Executive at <http://www.hse.gov.uk/stonemasonry/index.htm>

Stone Federation at <http://www.stonefed.org.uk/>

Quarry Partnership Team (QPT) at <http://www.safequarry.com/qpt.aspx>

Construction Dust Partnership (CDP) at <http://www.citb.co.uk/health-safety-and-other-topics/health-safety/construction-dust-partnership/>

For information about health and safety visit <https://books.hse.gov.uk> or <http://www.hse.gov.uk>.

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