

ST2

COSHH essentials for stone workers: 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, and supervisors. It 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.

Automated boring and polishing using rotary tools

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

What this sheet covers

This sheet describes good control practice for Respirable Crystalline Silica (RCS) dust from the automated boring and polishing of stone using rotary tools. Manual working of stone using rotary tools is covered in Sheet ST3 (see Essential information).

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

This is achieved by following good control practice (ie follow all points described in this sheet or use equally effective measures), and by reducing exposure to below the relevant workplace exposure limits (WELs).

Main points

- Boring 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 in Essential information).
- Dust suppression using water (water suppression) will normally be required, and the mist generated needs to be controlled.
- Dusty work clothing may also be a significant source of RCS exposure.
- Regularly check and review all elements of your control measures to ensure they remain effective in providing adequate control.
- Provide health surveillance when workers are regularly exposed to RCS dust and there is a reasonable likelihood that chronic obstructive pulmonary disease (COPD) and/or silicosis may develop.

Hazards

Crystalline silica dust, which is fine enough to reach deep inside the lung, is known as respirable crystalline silica (RCS). Exposure to RCS can cause silicosis, where irreversible lung damage can be present before any symptoms develop. Silicosis may continue to worsen even after exposure to RCS stops. RCS can also cause other serious diseases such as COPD and lung cancer. The workplace exposure limit for RCS is detailed in HSE publication EH40/2005 Workplace Exposure Limits (see Essential information).

RCS dust is also abrasive and drying when in contact with skin and can lead to contact dermatitis. Wet working can also lead to 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 to reduce spreading of airborne contamination to other workers.
- ✓ Monitor the process to reduce the need for people to be in the area eg use CCTV.
- ✓ Where possible slope floors gently towards gulleys to help drainage of water from use of water suppression and/or 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

- ✓ Enclose the process, as far as reasonably practicable, to minimise any mist generated. See Figure 1 & 2.

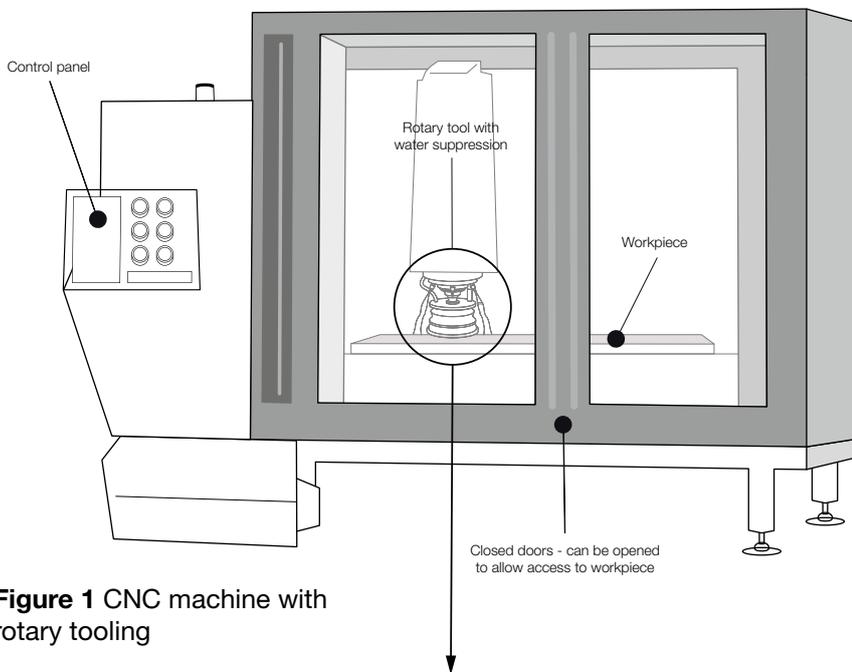


Figure 1 CNC machine with rotary tooling

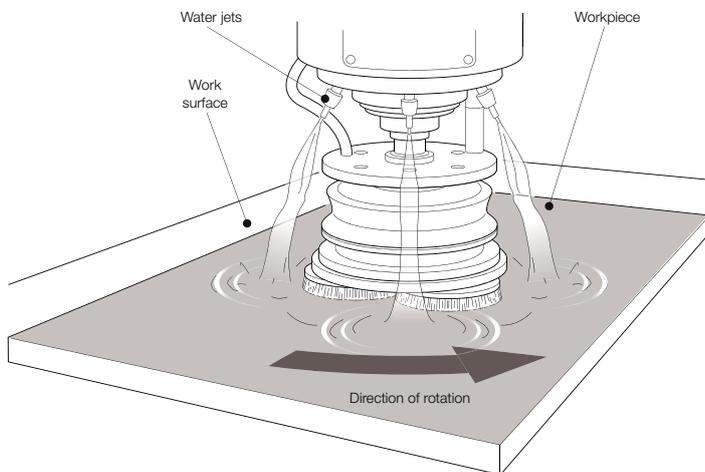
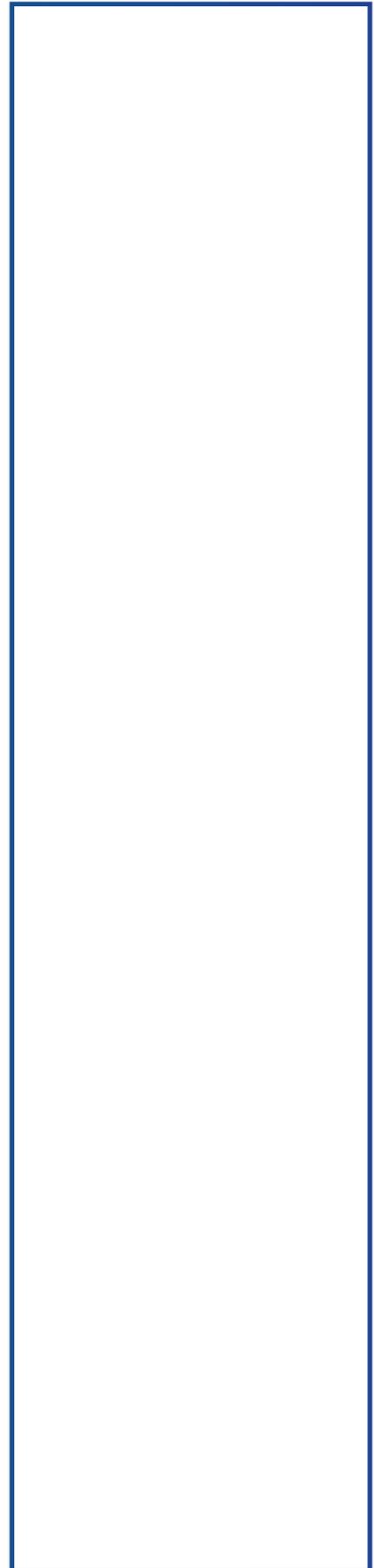


Figure 2 Expanded view of rotary tool with water suppression



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- ✓ Locate the controls away from the equipment to reduce the need to access the area.
 - ✓ Use effective water suppression to reduce dust emissions.
 - ✓ Make sure the water suppression is positioned and used correctly.
 - ✓ Provide an adequate supply of clean water for dust suppression.
 - ✓ If the water is recirculated:
 - establish a program of checks and maintenance to ensure that conditions do not allow the growth of bacteria, including legionella
 - replace contaminated water regularly to prevent the build-up of silica in the water. This could adversely affect both the machinery tooling, increasing the need for maintenance, and the effectiveness of the water suppression.
 - ✓ Control any mists generated by water suppression, because they will contain crystalline silica particles.
 - ✓ Consider whether the mist can be effectively extracted by local exhaust ventilation.
 - ✓ Apply water near the point of processing to limit the generation of mist containing crystalline silica.
 - ✓ If reasonably practicable extract the mist with local exhaust ventilation (LEV) - ensure the system is capable of handling mist.
 - ✓ Provide a good standard of general ventilation to prevent the build-up of mist. This can be natural ventilation from doors, windows etc, or controlled, where air is supplied or removed by a powered fan.
 - ✓ Keep surfaces clean and never let slurry dry out.

Respiratory protective equipment (RPE)

- ✓ RPE is normally needed if the worker needs to carry out any work near the rotary tool where exposure to the mist can occur.
- ✓ RPE is needed for cleaning and maintenance.
- ✓ Provide RPE with an assigned protection factor (APF) of at least 20 (see sheet R3 in Essential information).
- ✓ Face fit testing is required for RPE with a tight-fitting face seal (see INDG479 in Essential information).
- ✓ Workers wearing tight fitting RPE must be clean shaven.
- ✓ Workers should be trained how to check RPE is working properly before every use, how to fit it properly and how to look after it.
- ✓ Provide powered respirators if RPE needs to be worn continuously for more than one hour.
- ✓ Ensure workers discard disposable RPE at the end of the shift, or sooner if their RPE becomes clogged.
- ✓ 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.
- ✓ Keep RPE clean and store it in a clean place.
- ✓ For reusable RPE, a thorough maintenance, examination and test should be carried out at least once a month. However, if the RPE is used only occasionally, an examination and test should be carried out before use and, in any event, the interval should not exceed three months.

Personal protective equipment (PPE)

- ✓ Ask your supplier to advise on suitable PPE.
- ✓ Consult workers to ensure PPE will be suitable for them.
- ✓ Make suitable arrangements for maintenance, storage and replacement of PPE.
- ✓ Provide separate storage for clean and contaminated PPE.
- ✓ Provide coveralls that do not retain dust – synthetic rather than cotton. If exposure to the mist is likely, then the coveralls should also provide water protection.
- ✓ Keep any PPE clean and replace at recommended intervals.
- ✓ Do not allow workers to wear their own outer clothing in contaminated areas.
- ✓ Provide protective gloves suitable for wet working and contact with crystalline silica.
- ✓ Provide suitable footwear for working in a wet floor area.
- ✓ Use a contract laundry or a suitable equivalent to wash work clothing. Warn them that the dust contains silica. Do not allow workers to launder work clothing at home.

Personal decontamination and skin care

- ✓ Prohibit eating, drinking and smoking in contaminated areas.
- ✓ 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.
- ✓ Barrier creams' are not 'liquid gloves' and they do not provide a full barrier.

Maintenance, examination and testing

- ✓ Extraction and plant wear out quickly especially as silica-containing dusts are abrasive. Plan regular maintenance.
- ✓ 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.
- ✓ Ensure that the water suppression system works properly before use.
- ✓ 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. See sheet G409 in Essential information.

Cleaning and housekeeping

- ✓ 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 the dust Class M (medium hazard) classification.
- ✓ Clear up slurry and dispose of it safely.

- ✓ Avoid the use of brushes or compressed air for removing dust from clothing, surfaces and machinery.

Health surveillance

- ✓ Provide health surveillance when workers are regularly exposed to RCS dust and there is a reasonable likelihood that COPD and/or silicosis, or dermatitis may develop. See sheet G404 in Essential information.
- ✓ Provide health surveillance for dermatitis where there is a reasonable likelihood that dermatitis may occur in your workplace. See sheet G403 in Essential information.
- ✓ Workers undertaking the task described in this sheet will normally need health surveillance.
- ✓ You will need to take advice from a competent occupational health professional (a doctor or nurse) when setting up a health surveillance programme.

Training and supervision

- ✓ Tell workers about the hazards associated with their work and how to recognise early signs of lung damage and dermatitis 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.
- ✓ Provide supervision – ensure that safe work procedures are followed.
- ✓ Involve managers and supervisors in health and safety training.
- ✓ Training records are helpful to demonstrate what information, instruction and training has been provided.

Essential information

ST0 – Advice for managers.

<https://www.hse.gov.uk/pubns/guidance/st0.pdf>

ST3 – Cutting and polishing using hand-held rotary tools.

<https://www.hse.gov.uk/pubns/guidance/st3.pdf>

G403 – Health surveillance for occupational dermatitis.

<https://www.hse.gov.uk/pubns/guidance/g403.pdf>

G404 – Health surveillance for those exposed to respirable crystalline silica (RCS). <https://www.hse.gov.uk/pubns/guidance/g404.pdf>

G409 – Exposure measurement: Air sampling.

<https://www.hse.gov.uk/pubns/guidance/g409.pdf>

R3 – UK Standard Assigned Protection Factor 20 (APF 20)

<https://www.hse.gov.uk/pubns/guidance/rpe3.pdf>

Guidance on respiratory protective equipment (RPE) fit testing Leaflet INDG479(rev1) HSE 2019 www.hse.gov.uk/pubns/indg479.htm

EH40/2005 - Workplace Exposure Limits:

www.hse.gov.uk/pubns/priced/eh40.pdf.

Further information

You can find the full COSHH essentials series at
<https://www.hse.gov.uk/coshh/essentials/direct-advice/stonemasons.htm>

Control of exposure to silica dust - A guide for employees indg463.pdf
([hse.gov.uk](https://www.hse.gov.uk))

Controlling exposure to stone dust, HSG201.
<https://www.hse.gov.uk/pubns/priced/hsg201.pdf>

Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV) HSG258 HSE 2017
www.hse.gov.uk/pubns/books/hsg258.htm

G406 – New and existing engineering control systems.
<https://www.hse.gov.uk/pubns/guidance/g406.pdf>

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

Health surveillance for those exposed to respirable crystalline silica (RCS) - Guidance for occupational health professionals. Published 2015
<http://www.hse.gov.uk/pubns/priced/healthsurveillance.pdf>

The dust lamp: A simple tool for observing the presence of airborne particles MDHS82. <https://www.hse.gov.uk/pubns/mdhs/pdfs/mdhs82-2.pdf>

Control of substances hazardous to health: The Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice and guidance L5 (Sixth edition) HSE 2013
<https://www.hse.gov.uk/pubns/books/l5.htm>

Institute of Local Exhaust Ventilation Engineers Accredited members
<https://www.cibse.org/get-involved/societies/institute-of-local-exhaust-ventilation-engineers-ileve>

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>
 - Worktop Fabricators Federation <https://www.worktopfabricators.org/>
 - 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/>
- Information on assessing whether legionella is a risk can be found at <http://www.hse.gov.uk/legionnaires/other-risk-systems.htm>

British Occupational Hygiene Society (BOHS) Directory of Occupational Hygiene Services
<https://www.bohs.org/information-guidance/>

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

You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

To report inconsistencies or inaccuracies in this guidance, email: commissioning@williamslea.com

Employee checklist

- Do you understand the health hazards associated with your work?
- Are you sure about safe work procedures?
- Are you sure how to use all controls?
- If you find any problems, tell your supervisor, don't just carry on working.
- Is the water suppression system working effectively?
- Co-operate with health surveillance.
- Use, maintain and store your PPE in accordance with instructions. Do not take PPE home for laundering.
- Check that any RPE works properly every time you use it. Look for signs of leaks, wear and damage.
- Wash hands before eating, drinking, smoking, using the lavatory and after work.
- Follow any skin care programme provided. Never use solvents to clean your skin.