BK0

Advice for managers

COSHH essentials in brick and tile making: 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.

Introduction

HSE has produced these advice sheets to help employers control health risks from hazardous substances in the workplace.

The BK series of control guidance sheets describe what is expected for controlling exposure to respirable crystalline silica (RCS) during the manufacture of bricks. Information in these sheets may apply to anyone in related activities eg construction.

High levels of RCS, which is hazardous to health, can be generated during the movement and manufacturing of brick.

Common materials that contain crystalline silica include clay, sand and brick at concentrations given in the table below. Fuel ash also contains crystalline silica.

Material	Crystalline silica content (%w/w)
Sand, gravel, flint	more than 70%
Marl	up to 60%
Slip, glazes, colours	10% to 60% dry composition
Tile	30% to 45%
Ball clay	15% to 30%
Brick	up to 30%

In addition to the manufacturing of bricks, dust containing RCS from surfaces (including contaminated workwear) and maintenance tasks can also result in significant exposures. Separation of workers from the task (eg segregated work areas and automated controls), extraction (also known as local exhaust ventilation, LEV) and personal protective equipment (PPE), and good management arrangements eg for cleaning and housekeeping, are important to adequately control worker exposure.

Exposure control measures should be focused at source. However, misting may help reduce background airborne levels of RCS, but its effectiveness depends on a number of factors. This includes the nature of the silica-containing material and characteristics of the mist (eg direction, flow rate, droplet size etc). If a misting system is used as part of your set of control measures required for adequate control of exposure to RCS, it must be reliable, effective and regularly maintained and checked to ensure water quality, flow etc.

What the sheets cover

The BK series of sheets covers the key points you need to follow to reduce exposure to dust containing RCS to an adequate level to protect the health of workers.

BK1	Clay milling
BK2	Sand moving and screening
BK3	Facing green bricks with sand
BK4	Moving and setting of green and fired bricks
BK5	Dehacking
BK6	Withdrawn
BK7	Ventilated vehicle cabs

How to use the sheets

- Follow all points described in the sheets or use equally effective measures.
- Consider the processes/tasks and hazardous substances in your workplace.
- Look for opportunities to substitute with less hazardous materials.
- Examine the advice sheets for each of the tasks.
- Examine the essential information sheets listed on each advice sheet.
- Compare operations in your workplace with recommendations in the advice sheets for all of the relevant tasks.
- Record your findings and any actions you need to take covering: issues identified, planned actions, target completion date, person responsible, status of any issues, and a review of effectiveness (this forms part of your risk assessment).
- Keep a record of your actions to control exposure of workers to hazardous materials.

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 chronic obstructive pulmonary disease (COPD) and lung cancer. The workplace exposure limit for RCS is detailed in HSE publication EH40/2005 Workplace Exposure Limits (see Essential information).

✓ Inhaling RCS can lead to:

- Silicosis
- Exposure to RCS over a long period can cause scarring of the lung tissue with a loss of lung function.
- In the early stages of disease there are often no symptoms.
- As the disease gets worse there is shortness of breath and eventually individuals may find it difficult to walk short distances.
- Acute silicosis is a rare complication of short-term exposure to very large amounts of crystalline silica; this condition is life-threatening.
- Workers with silicosis are also at an increased risk of tuberculosis, kidney disease and arthritis.
- Lung cancer
- Chronic obstructive pulmonary disease (COPD) which is a long-term illness that develops gradually over several years. The lungs are permanently damaged making it difficult to breathe. 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. Wet working can also lead to dermatitis.

How to manage the health risk from RCS

✓ Reducing exposure to an adequate level always involves a mixture of equipment and ways of working. This means employers should:
- choose the most effective and reliable control measures;
- ensure controls work effectively when first used, and continue to protect people by carrying out regular maintenance;
- ensure controls are used properly by instructing, training and supervising workers;
- regularly check and review all elements of your control measures to ensure they are protecting workers, taking corrective action when needed.

✓ Follow all the points listed below and what is described in the BK series sheets, or make sure you use equally effective measures to adequately control exposure to dust containing RCS.

Reduce the amount of RCS dust generated

✓ Use clay with a lower crystalline silica content and/or higher water content.

✓ Use alternatives to silica sand, or sand with a lower crystalline silica content for facing bricks when reasonably practicable.

✓ Keep clay, sand and bricks damp when being moved to reduce dust emissions if appropriate

Control RCS exposure

✓ Separate the worker from the task and source of dust, eg
- Automate and enclose processes when reasonably practicable.
- Provide ventilated cabins supplying clean air if workers cannot be separated from the source of dust.

✓ Provide effective dust extraction (also known as local exhaust ventilation or LEV).

✓ Discharge extracted air to a safe place outside the building away from doors, windows and air vents.

✓ Do not use a recirculating LEV system unless the air is thoroughly cleaned before its return to the workplace.

Make sure people are responsible for carrying out regular checks and maintenance

✓ Ensure the LEV systems continue to work effectively through daily, weekly, and monthly checks – follow manufacturer's instructions as appropriate.
- fit an indicator or alarm to show the system is working effectively.
- regularly maintain and check all parts of the system, including moving parts eg fan bearings – remember RCS is abrasive. Repair any faults or damaged parts found.
- Have a thorough examination and test carried out by a competent person at least every 14 months (this is a legal requirement).
- Keep records of maintenance and checks for 5 years.

✓ Clean down the equipment before starting maintenance – use wet or dustless methods.

- ✓ Air monitoring may be needed to show that adequate control of exposure to RCS is being achieved by the systems in place. See G409 in Essential information.

Provide PPE, including respiratory protective equipment (RPE), when engineering controls alone are inadequate to control the risk.

- ✓ Have an effective management programme to ensure that PPE is used correctly used.
- ✓ Ensure reusable PPE, including RPE, is appropriately cleaned, stored and kept in working order.
- ✓ Select suitable and adequate RPE for the task in consultation with the workforce eg RPE with an assigned protection factor (APF) of at least 20 (see sheet R3 in Essential information).
- ✓ Provide powered respirators or breathing apparatus if the RPE needs to be worn continuously for more than one hour. See sheets R4 and R5 in Essential information.
- ✓ Air supplied to breathing apparatus should meet minimum quality requirements, in line with the latest British standard.
- ✓ Workers must be face fit tested and be clean shaven when using RPE that relies on a tight fitting seal to the face (see Fit2Fit and INDG479 in Essential information).
- ✓ For reusable RPE 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.
- ✓ 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.
- ✓ Provide workers with coveralls that do not retain dust – synthetic rather than cotton.
- ✓ 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.

Implement effective cleaning regimes

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - at least once a week.
- ✓ Do not allow dust to accumulate on surfaces – implement a high standard of regular cleaning and housekeeping using wet or vacuum methods.
- ✓ Use vacuum equipment that meets at least the dust Class M (medium hazard) classification.
- ✓ If using wet methods, ensure that any slurry created does not dry out and create an additional source of RCS dust.
- ✓ Avoid the use of brushes or compressed air for removing dust from clothing, surfaces and machinery.

Ensure your workers understand the risks from RCS

This will include:

- ✓ the health hazards of RCS, how they can be exposed to it and the importance of control measures (such as extraction, RPE and cleaning regimes).
- ✓ safe work procedures, including how to safely use, check and maintain process equipment and control measures. Provide supervision to ensure that safe working procedures are followed.
- ✓ maintaining good skin hygiene and minimising their risk of dermatitis.
- ✓ how to recognize and report any faults, concerns, or early signs of ill-health.
- ✓ keeping training records is helpful to demonstrate what information, instruction and training has been provided.

Carry out health surveillance for all workers regularly exposed to RCS dust

To detect early signs of COPD, silicosis and dermatitis, you should carry out health surveillance (see guidance sheets G403 and G404 in Essential information).

- ✓ Early signs of these diseases may indicate that you are not adequately controlling exposure.
- ✓ You will need to take advice from a competent occupational health professional (doctor or nurse) when setting up a health surveillance programme.

By implementing these measures in your workplace you will be reducing the risk of exposure to RCS and complying with the law, but you will need to keep checking and reviewing them so that they continue to be effective.

If you are in doubt about the controls necessary, or how to implement them, in order to achieve adequate control of exposure to RCS you should seek competent advice eg from the BOHS Directory of Occupational Hygiene Services.

Essential information

R3 - UK Assigned Standard Protection Factor 20 (APF20) https://www.hse.gov.uk/pubns/guidance/rpe3.pdf

R4 - UK Assigned Standard Protection Factor 40 (APF40) https://www.hse.gov.uk/pubns/guidance/rpe4.pdf

R5 – Breathing Apparatus with UK Assigned Standard Protection Factor 40 (APF40) https://www.hse.gov.uk/pubns/guidance/rpe5.pdf

G403 – Health surveillance for occupational contact dermatitis (OCD). https://www.hse.gov.uk/pubns/guidance/g403.pdf

G404 – Health surveillance for silicosis. https://www.hse.gov.uk/pubns/guidance/g404.pdf

G409 – Exposure measurement: Air sampling. https://www.hse.gov.uk/pubns/guidance/g409.pdf

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

Fit2fit Accreditation - Fit2Fit RPE Fit Test Providers Accreditation Scheme

EH40/2005 Workplace exposure limits HSE 2020 www.hse.gov.uk/pubns/books/eh40.htm

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

Further information

Control of exposure to silica dust - A guide for employees INDG463. https://www.hse.gov.uk/pubns/indg463.pdf

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

New and existing engineering control systems COSHH essentials guidance sheet G406 HSE www.hse.gov.uk/pubns/guidance/g406.pdf

Respiratory protective equipment at work: A practical guide HSG53 (Fourth edition) HSE 2013 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

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 Institute of Local Exhaust Ventilation Engineers (ILEVE) | CIBSE

The Health and Safety Executive at http://www.hse.gov.uk/non-metallic-minerals/heavy-clay.htm

Information on health and safety in the brick manufacturing industry can be obtained from the British Ceramic Confederation at www.ceramfed.co.uk

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