



Controlling Exposures to prevent occupational lung disease in the construction industry



Stonemason

HAZARDS AND RISKS

When different types of stone are worked by cutting, grinding and chiselling with hand and power tools, airborne dust is generated that can cause serious lung conditions if inhaled over time. Some stonemasonry trades may involve the application of fine decorative detail to stone, which often requires working very closely to the dust source.

Stone dust and respirable crystalline silica (RCS)

Stone dust contains varying amounts of silica, and comprises a mixture of different sized particles. Breathing in the smaller respirable sized fraction of the silica dust – respirable crystalline silica (RCS) - can result in the development of serious lung diseases, including fibrosis, silicosis, chronic obstructive pulmonary disease (COPD) and lung cancer. These diseases may cause permanent disability and early death, and it is estimated that over 500 construction workers die every year from exposure to silica dust. Inhaling any dust can lead to lung irritation, asthma and other acute and chronic respirable conditions.

CONTROL OPTIONS

Engineering controls

Local exhaust ventilation (LEV):

- Enclose the dusty process in a down draught or cross draught booth so that dust laden air is drawn away from the work area.
- Use "on-tool" LEV: also known as a "shroud" - which encloses the grinding wheel. A vacuum source is attached to the shroud to remove dust generated by the grinder at the source of emission.

Safe working methods

Water suppression:

- Pre-soak stone to minimise dust creation and apply running water to the process via on-tool suppression to further reduce exposures.

PPE

- Respiratory protective equipment (RPE) with an APF protection rating of 20-40 is required for high silica content materials. Wearers must be face fit tested to ensure the RPE affords each individual the anticipated level of protection.

Preferred control measures

- Water suppression with supplemental RPE. On tool LEV with supplemental RPE for grinding work.

MANAGING THE RISK

Training & communication, supervision, maintenance & testing of controls and air

monitoring* are all vital aspects of managing the risk, in addition to health surveillance which can be a requirement in certain circumstances.

See our introductory *Respiratory Health Hazards in Construction Fact Sheet Series: Overview* for more information about what things to consider and implement.

Air monitoring*

Air monitoring is a specialist activity. It may be needed as part of a COSHH assessment, as a periodic check on control effectiveness and to assess compliance with relevant WELs, or where there has been a failure in a control (for example if a worker reports respiratory symptoms). A qualified Occupational Hygienist can ensure it is carried out in a way that provides meaningful and helpful results.

The decision to undertake exposure monitoring should be made in accordance with HSE's monitoring strategies outlined in HSG173. In some situation, qualitative or semi-quantitative methods may be suitable. See also COSHH regulation 10 ACOP which details when exposure monitoring is necessary or unnecessary.

Also, see HSE leaflet G409, Exposure measurement: Air sampling.
www.hse.gov.uk/pubns/guidance/g409.pdf



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WORKPLACE EXPOSURE LIMITS (WELs) & EXPOSURE LEVELS

Agent or substance	Control/Exposure Limit	Exposure Levels
Silica - RCS	0.1 mg/m ³ (8 hr TWA). All Party Parliamentary Group for Respiratory Health (which is an informal, cross-party group formed by MPs and Members of the House of Lords) published a report named "Silica- the next asbestos". This recommends that the WEL for RCS is reduced to 0.05 mg.m-3 as this would be in line with the recommended exposure standard from the Scientific Committee on Occupational Exposure Limits proposed in 2003.	Exposure to RCS is dependent on the silica content of the material being worked, which varies. Sandstone (70-90% silica) and concrete (25-75% silica) typically contain the most. Granite, slate and brick (around 30% silica); and limestone and marble (around 2%) usually contain the least. Grinding and cutting without water suppression is likely to produce the highest levels of stone dust, and risk of exposure to RCS is also affected by the frequency and duration of the work.

Personal exposure monitoring of stonemasons working over sampling periods representative of full shift exposure have demonstrated the following levels of exposure to RCS.

Material and Task	RCS range 8hr TWA mg/m ³
Sandstone	<0.02-6.00
Cutting angle grinder	0.26-1.30
Cutting water-cooled primary saw	<0.02-0.13
Grinding angle grinder	<0.02-6.00
Decoration hand and pneumatic chisel	<0.02-0.07
Limestone	<0.02-0.03
Cutting angle grinder	<0.02
Grinding angle grinder	<0.02
Decoration hand and pneumatic chisel	<0.02-0.03
Lime Mortar	<0.02-0.06
Repointing	<0.02-0.06
Granite	<0.02-0.21
Cutting water-cooled primary saw	<0.02-0.03
Grinding angle grinder	<0.02-0.21

Further information

- Controlling exposure to stonemasonry dust: www.hse.gov.uk/pubns/priced/hsg201.pdf
- COSHH Essentials: Stonemasons: www.hse.gov.uk/coshh/essentials/direct-advice/stonemasons.htm
- COSHH Essentials: Hand held rotary tools: www.hse.gov.uk/pubns/guidance/st3.pdf
- COSHH Essentials: Health surveillance for those exposed to respirable crystalline silica (RCS): www.hse.gov.uk/pubns/guidance/g404.pdf
- Controlling airborne contaminants at work, a guide to local exhaust ventilation (LEV): www.hse.gov.uk/pubns/priced/hsg258.pdf