

# 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. The WHO\* and the ILO\* estimate that approximately 30 people die annually in Ireland from occupational exposure to Respirable Crystalline Silica (RCS).

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.

Employers should conduct a thorough risk assessment to determine the specific hazards in their stone masonry operations and implement a combination of controls from the hierarchy, prioritizing the most effective methods first. This integrated approach helps create a safer work environment and reduces the likelihood of accidents and injuries for stone masons.

## MANAGING THE RISK

### Training & communication

Supervision, maintenance and 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.

### Air monitoring

Air monitoring is a specialist activity. It may be required as a result of a chemical agents risk assessment, as a periodic check on control effectiveness and to assess compliance with relevant Occupational Exposure Limit Values (OELVs), 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.

To obtain the most accurate and up-to-date information, it is recommended to visit the Health and Safety Authority (HSA) website or contact the HSA directly. The website may have the latest versions of the relevant code of practice, guidelines, and regulations.

<https://www.hsa.ie>

\*The WHO is the World Health Organization and the ILO is the International Labour Organization. Both are agencies of the United Nations.

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## OCCUPATIONAL EXPOSURE LIMITS (OELs)

Agent or substance	Control/Exposure Limit	Exposure Levels
Silica - RCS	0.1 mg/m <sup>3</sup> (8-hr reference period ).	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 8-hr TWA mg/m <sup>3</sup>
<b>Sandstone</b>	<b>&lt;0.02-6.00</b>
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
<b>Limestone</b>	<b>&lt;0.02-0.03</b>
Cutting angle grinder	<0.02
Grinding angle grinder	<0.02
Decoration hand and pneumatic chisel	<0.02-0.03
<b>Lime Mortar</b>	<b>&lt;0.02-0.06</b>
Repointing	<0.02-0.06
<b>Granite</b>	<b>&lt;0.02-0.21</b>
Cutting water-cooled primary saw	<0.02-0.03
Grinding angle grinder	<0.02-0.21

### Further Information

[Safety, Health and Welfare at Work \(Chemical Agents\) Regulations, 2001. S.I. No. 619/2001, as amended 2015, 2021.](#)

[Safety, Health and Welfare at Work \(Carcinogens, Mutagens & Reprotoxic Substances\) Regulations, 2024](#)

[Current Chemical Agents Code of Practice 2024 - Health and Safety Authority \(hsa.ie\)](#)

[Your steps to Chemical Safety - A Guide for Small Business - Health and Safety Authority \(hsa.ie\)](#)

[Guidelines on Occupational Asthma - Health and Safety Authority \(hsa.ie\)](#)

[Guidelines on Occupational Dermatitis. Health and Safety Authority.](#)