BREATHE FREELY IRELAND

Controlling exposures to prevent occupational lung disease in CONSTRUCTION

Bricklayer

HAZARDS AND RISKS

Bricklayers can be frequently exposed to high levels of dusts through many regular tasks. Mixing cement and mortar; emptying or disposing of cement bags; cutting, sawing and drilling through bricks; and sweeping or cleaning floors and block work can all generate airborne dust which is easily inhaled. Close-up work, such as brick marking and carving, can also mean the worker is breathing very near to a dust source.

Dust & Respirable Crystalline Silica (RCS)

Construction dust is a general term for dust typically found on a construction site; the risk to health depends on the actual composition of the dust as well as the level of exposure to it. The highest risk to a bricklayer's health is likely to be from breathing in silica dust. Silica occurs in many types of stone, including concrete and brick. Inhaling fine silica dust (respirable crystalline silica or RCS) over time can lead to serious lung diseases, including fibrosis, silicosis, chronic obstructive pulmonary disease (COPD) and lung cancer. These diseases cause permanent disability and early death. Breathing in any dust can potentially lead to lung irritation, asthma and other acute and chronic respirable conditions depending on the nature of the hazardous substance. The WHO* and the ILO* estimate that approximately 30 people die annually in Ireland from occupational exposure to respirable crystalline silica (RCS).

Exposure levels

Exposure to RCS varies according to the silica content of the mate rial being worked. Concrete typically has a high silica content of between 25-75%, as does brick which contains around 30-40% silica. Dry cutting/sawing without dust extraction is likely to produce the highest levels of airborne brick/stone dust. Wet working has been shown to reduce exposure levels by up to 91%. Exposure levels are also affected by the frequency and duration of the work.

The WHO is the World Health Organisation, and the ILO is the International Labour Organisation. They are both United Nations agencies.

CONTROL OPTIONS

Safe working methods

- Block cutting
  - Use block splitters to eliminate dust.
  - Use wet saws for cutting.
  - Carry out cutting in well-ventilated areas.
- Mixing cement
  - Mixing dry cement in a well-ventilated area.
  - Carefully empty and dispose of cement bags to minimise dust release.
- Cleaning
  - Clean up regularly using industrial vacuums or wet cleaning.
  - Avoid dry sweeping or use of compressed air to remove dust from clothing.

PPE

Respiratory protective equipment (RPE) must be worn for brick cutting and cement mixing. If the dust cannot be adequately controlled, the appropriate type of respiratory protection will depend on the nature and concentration of the airborne contaminants. Common types of respiratory protection include disposable masks (e.g., N95 respirators) or more robust respirators with higher filtration capabilities. A P3 particulate filter fitted to a half or full-face mask to provide effective protection and be CE marked. All RPE should fit the employee correctly. Refer to the HSA's guide for respiratory equipment for further information on RPE. To find the most current guidance on respiratory protective equipment in Ireland, you should refer to the official website of the Health and Safety Authority (HSA)

MANAGING THE RISK

Elimination/prevention

Use pre-cut bricks/blocks and ready-mixed concrete where possible.

Engineering controls

- Cutting
  - Use on-tool dust extraction where use of block splitters/wet sawing is not possible.
- Cleaning
  - Use industrial vacuum cleaners class M or H fitted with a HEPA filter wherever possible for cleaning.

Preferred control methods

Use of pre-cut materials and ready-mixed concrete

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.

Air monitoring

Air monitoring is a specialist activity. It may be needed as part of a chemical agents risk assessment, as a periodic check on control effectiveness and to assess compliance with relevant 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

See reverse for Occupational Exposure Limit Values (OELVs)

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OCCUPATIONAL EXPOSURE LIMIT VALUES (OELVs) & EXPOSURE LEVELS

Agent or substance	Control/Exposure Limit	Comments
Respirable crystalline silica	0.1 mg/m^3 (8-hour reference period)	Different types of stone contain different amounts of silica, with sandstone (70-90% silica) and concrete (anything from 25-75% silica) typically containing the most, granite, slate and brick at around 30% and limestone and marble 2% silica. All dust exposure levels are affected by the frequency and duration of the work and are likely to be higher in poorly ventilated spaces. Dry working without extraction control is likely to produce the highest levels of dust.
Dusts, non-specific total inhalable respirable	 10 mg/m^3 (8-hour reference period) 4 mg/m^3 (8-hour reference period)	
Portland cement	1 mg/m^3 (R) (8-hour reference period)	R is the respirable fraction that penetrates deep into the lung. These are very small particles.
Hardwood Dust	2 mg/m^3 (8-hour reference period)	Capable of causing cancer. Capable of causing occupational asthma. If hardwood dusts are mixed with other wood dusts, the OEL shall apply to all the wood dusts present in that mixture. All dust exposure levels are affected by the frequency and duration of the work and are likely to be higher in poorly ventilated spaces. Dry working without extraction controls is likely to produce the highest levels of dust
Softwood Dust	5 mg/m^3 (8-hour reference period)	Capable of causing occupational asthma. If softwood dusts are mixed with hardwood dusts, the OEL for hardwood dusts shall apply to all the wood dusts present in that mixture. All dust exposure levels are affected by the frequency and duration of the work and are likely to be higher in poorly ventilated spaces. Dry working without extraction controls is likely to produce the highest levels of dust

Further information

Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001 to 2021

Safety, Health and Welfare at Work (Carcinogens, Mutagens and Reprotoxic Substances) Regulations 2024

Current Chemical Agents Code of Practice - Health and Safety Authority (hsa.ie)

Control of Chemical Agents: Your Steps to chemical safety. A guide for small business. Guidelines on Occupational Asthma. Health and Safety Authority.

Guidelines on Occupational Dermatitis - Health and Safety Authority (hsa.ie)

HSA Guide to Respiratory Protective Equipment

Chemical and Hazardous Substances/Silica Dust Information Sheet