BREATHE FREELY Australia

**Controlling Exposures to prevent occupational lung disease in the construction industry**

# Road Worker

## HAZARDS AND RISKS

There are a number of significant respiratory health hazards linked to road construction, in particular, work associated with cutting/drilling/breaking paving blocks, kerbs, flags, concrete and rock; laying and repair of asphalt; and any work carried out adjacent to diesel-emitting generators and site vehicles.

### Silica dust

Silica occurs in many types of stone and concrete. It will be released as a dust during drilling and cutting processes. Inhaling fine silica dust (respirable crystalline silica or RCS) can lead to serious lung diseases, including fibrosis, silicosis, chronic obstructive pulmonary disease (COPD) and lung cancer. It is estimated that in Australia over 230 workers will die every year from exposure to silica dust.

### Bitumen/asphalt fumes

Bitumen (often referred to as asphalt) is commonly used for road surfacing. Hot bitumen work releases fumes containing polyaromatic hygdrocarbons (PAHs)/particulate, which, when inhaled, can cause irritation of the respiratory tract and possibly lung cancer.

### Diesel engine exhaust emissions (DEEEs)

DEEEs contain a complex mix of gaseous components (eg. nitrogen dioxide, carbon monoxide) and various particulates (Diesel particulate matter, DPM).

Exposure to these substances is more likely when working near to the emissions sources, such as generators and site vehicles like excavators, planers and lorries. When inhaled, the DPM has been linked to a long term increased risk of lung cancer, as well as a definite risk of respiratory tract irritation causing symptoms such as coughing, breathlessness, rhinitis and wheezing.

## CONTROL OPTIONS

### Elimination/prevention

**Silica dust**

- Buy in ready cut materials where possible.
- **DEEEs/DPM**
- Use alternative fuels for equipment where possible.
- Use vehicles fitted with DPM filters on exhaust .

### Engineering controls

**Silica dust**

- Use power tools with integrated or "on-tool" dust extraction.
- Use water suppression where possible.

### Safe working methods

- Implement job rotation for all tasks to limit one person's exposure.

**Silica dust**

- Reduce dust generation: use non-electrical saws with water suppression; use block splitters rather than cut off saws; minimise the number of cuts/breaks.

**Bitumen/asphalt fumes**

- Keep workers and others not directly involved in the task as far away from the source of the fumes as possible.

**DEEEs/DPM**

- Keep workers away from exhausts.
- Choose vehicles with high level exhausts if possible.
- Locate generators / plant in open areas and clear of confined spaces or provide mechanical ventilation to prevent accumulation of emissions.
- Keep engine idling and revving to a minimum.

### PPE

**Silica dust**

- Risk assess the tasks and also refer to the Australian Standard AS/NZ 1715 for RPE guidance.
- Use either P2 rated disposable respiratory protective equipment (RPE) or a half mask RPE with P2 filters.
- RPE should be compatible with any other PPE. Wearers of tight fitting RPE must be face fit tested to ensure the RPE affords each individual the anticipated level of protection.

## 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 risk assessment, as a periodic check on control effectiveness and to assess compliance with relevant WES, 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.

**See reverse for Workplace Exposure Standard (WES)**

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## WORKPLACE EXPOSURE STANDARDS (WES) & EXPOSURE LEVELS

| Agent or substance | Control/Exposure Limit | Exposure Levels |
|---|---|---|
| Silica - RCS | 0.05 mg/m$^3$ (8 hr TWA). | Different materials contain different amounts of silica, eg; concrete can comprise between 25-75%. Dry working in confined spaces will produce the highest exposure levels. |
| Asphalt/petroleum fumes (benzene solubles) (PAHs) | There is no current WES. | |
| Diesel Particulate Matter (DPM) | 0.1 mg/m3 (8 hr TWA). | |

### Further HSE information

- Silica dust: *www.hse.gov.uk/construction/healthrisks/cancer-and-construction/silica-dust.htm*
- Controlling construction dust with on-tool extraction: *www.hse.gov.uk/pubns/cis69.pdf*
- Controlling construction dust with on-tool extraction: *www.hse.gov.uk/construction/healthrisks/hazardous-substances/cutting-paving-blocks-kerbs-and-flags.htm*
- Control of diesel engine exhaust emissions in the workplace: *www.hse.gov.uk/pubns/priced/hsg187.pdf*