



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

# Electrical Engineer/Fitter

### HAZARDS AND RISKS

Installation, maintenance, and repair of electrical wiring, equipment, and fixtures can involve tasks which generate dusts and fumes which are harmful when inhaled. Activities that might put electricians at risk of such hazardous exposures include soldering and brazing to connect wires to sockets and terminals, and drilling and riveting when assembling parts and installing or examining electrical fixtures and appliances such as fuse boxes and generators and electrical control systems.

#### Asbestos fibres

Engineers may come into contact with or disturb a number of asbestos containing materials (ACMs), particularly if working in buildings built before 2000. Asbestos is classified as a category 1 carcinogen. Inhalation of asbestos fibres can cause mesothelioma, asbestos-related lung cancer, asbestosis, and pleural thickening - all fatal or serious and incurable diseases that can take years to develop.

#### Solder fumes

During soldering, the heating of flux containing rosin (or derivatives) produces fume, which if inhaled is one of the most significant causes of occupational asthma, an irreversible condition. The fumes can also act as an irritant to the upper respiratory tract.

#### Silica dust - respirable crystalline silica (RCS)

Silica is present in large amounts in most rocks, sand and clay, and in products such as bricks, concrete and mortar. Some of the dust created by drilling and riveting into these materials is fine enough to be breathed deeply into the lungs; this is called respirable crystalline silica (RCS) and exposure to RCS over many years or in extremely high doses 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 every year from over-exposure to silica dust.

#### Wood dust

Dust from softwood, hardwood, and wood-based products such as MDF and chipboard can cause asthma which is a serious, debilitating, and sometimes life-limiting condition. Exposure comes from cutting and drilling wood and from settled dust that is later disturbed. Fine dust particles are most likely to damage the lungs. Some wood types are known to cause cancer. Wood dust exposure may also cause dermatitis. The dermatitis risk is high for softwoods.

### CONTROL OPTIONS

#### Elimination/prevention

- Asbestos: The aim is to avoid exposure completely. Information on the presence of asbestos should come from the premises' asbestos management plan and asbestos register. For information on work tasks involving asbestos and how to safely carry them out, refer to the applicable OH&S regulations. (e.g. requirements for employers to notify the relevant regulatory enforcing authority, designate areas where the work is being done, ensure medical examinations take place, maintain health records, etc.)
- Choose methods which eliminate/minimise the use of hazardous materials eg. use rosin-free or rosin reduced solder; use soldering irons at the lowest temperature possible.

#### Engineering controls

- Use industrial class HEPA vacuums for cleaning up ACMs. Any handling of ACM should be undertaken by persons competent to do so and following the applicable OH&S regulations for that task.
- Use LEV, such as a back-draught partial enclosure and/or on-tool extraction, for soldering irons.

#### Safe working methods

- Minimize dust creation. (e.g. avoid or limit drilling, particularly of silica containing materials if at all possible; wet working; damp down before work and during debris removal and cleaning; use vacuums or wet cleaning, avoid dry sweeping or use of compressed air to remove dust; use hand tools in place of power tools if feasible.
- Ensure good natural ventilation of work area. Working with asbestos materials should be undertaken with strict precautions in place. These are outlined under the applicable jurisdictional OH&S regulations.

#### PPE

- For asbestos work, specific PPE as described by OH&S regulations (e.g. disposable coveralls, gloves, and foot protection) should be worn and disposed of as asbestos waste.
- PPE such as respiratory protective equipment (RPE) may be necessary while undertaking tasks involving wood dust, silica dust or solder fume. Use RPE selected in accordance with CSA Z94.4-11 *Selection, Use and Care of Respirators*.

### 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 an exposure risk assessment, as a periodic check on control effectiveness and to assess compliance with relevant occupational exposure limits, or where there has been a failure in a control (for example if a worker reports respiratory symptoms).

A qualified occupational hygienist or occupational hygiene technologist can ensure exposure monitoring is carried out in a way that provides meaningful and helpful results.