



Plumbing/Gas/Heating Engineer

HAZARDS AND RISKS

There are significant health hazards associated with plumbing/heating installation, maintenance and refurbishment work. Drilling, breaking and fixing pipework and tanks; cutting, pulling and sawing insulation materials; soldering, brazing and welding pipework; and applying paints and sealants are all regular tasks which can generate airborne substances which are harmful if inhaled.

Asbestos fibres*

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

Man Made Mineral Fibre (MMMMF)

Glass and mineral wools found in pipe, tank and loft insulation contain fibres that can be released during application or removal. Inhaling the fibres can cause acute irritation of the respiratory system and possibly a higher risk of lung cancer for particular forms of MMMMF such as refractory ceramic fibres and special purpose fibres (plumbers are unlikely to come across these specialist types of fibres in their line of work).

Solder rosin fume (colophony)

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

Welding fume**

The fume given off by welding is a mixture of airborne gases and very fine particles which can cause pneumonia, asthma, metal fume fever, throat and lung irritation and reduced lung function if inhaled. Exposure to some welding fume and gases can cause pulmonary edema, and lung/nasal cancers.

Isocyanates

Inhaling isocyanates generated through spray foam and two-pack spray paint products can cause occupational asthma and severe respiratory irritation.

Legionella bacteria

There is a risk of exposure to legionella bacteria in droplets of airborne water which, if inhaled, can cause Legionnaires' disease, a potentially fatal pneumonia.

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.)

MMMMF, Solder fume, and Isocyanates

- Use non-fibrous insulation in place of glass/mineral wools, or use bonded and covered MMMMF insulation materials if possible.
- Use push fit pipe and tank fittings to avoid soldering.
- Use rosin-free or rosin reduced solder.
- Use safer alternative products to isocyanate based spray foam insulation, isocyanate paints or epoxy paints; avoid excessive foam packing.

Engineering controls

- Use industrial HEPA vacuums for cleaning up ACMs/MMMF materials.
- Use local exhaust ventilation (LEV) systems, such as an extracted booth or cabinet, or tip extraction on the soldering iron, during soldering operations.

Safe working methods

- Choose work methods that avoid or limit cutting, drilling and sawing of MMMMF materials.
- Minimize dust creation (e.g. use water suppression for dusty tasks; use vacuum or wet cleaning techniques, avoid dry sweeping or compressed air to remove dust; use hand tools in place of power tools if feasible).
- Ensure good general ventilation when painting and implement job rotation where feasible.
- Refer to the owner/landlord's Legionella risk assessment where appropriate.

PPE

- For ACMs/MMMFs work, specific PPE as described by OH&S regulations (e.g. disposable coveralls, gloves, and foot protection) should be worn and disposed of as appropriate.
- PPE such as respiratory protective equipment (RPE) may be necessary while undertaking specific tasks. 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.