

M10-EN.10 ENGINEERING

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M10-EN.10.1 Legionnaires' disease

Health care workers can be exposed to the Legionnaires' disease from breathing aerosolized water that contains the legionella bacteria. Hazards of breathing contaminated, aerosolized water occur to those working in areas where cooling towers, humidifiers and/or air conditioning systems or domestic hot water systems are used. Also, they can be exposed while working in kitchens, janitorial closets, and showers, where spray nozzles are used. (Link: M10-EN.5.1.2)

M10-EN.10.2 Hazardous Chemicals

Employees can be exposed to hazardous chemicals from cleaning and maintenance work. Exposure can occur from paints, adhesives, and pesticides, solvents used for maintenance; waste anaesthetic gases and ethylene oxide during ventilation or exhaust systems repair and removal of these gases.

Safety Precautions

Employers have to:

- Inform their employees about the hazards and the identities of the chemicals they are exposed to while working
- Provide them with protective measures for the prevention of adverse effects.
- Install special ventilation and air monitoring practices, because paints, adhesives, solvents, and cleaners are can give off toxic vapours

M10-EN.10.3 Mercury Spills

Exposure to mercury occurs from accidental spills during repair of broken thermometers, sphygmomanometers, barometers, and gauges.

Safety Precautions

A health and safety program must exist, providing quick, safe, clean-up of spills by workers trained in proper procedures. Any potential spill can be prevented by replacing outdated glass thermometers, and sphygmomanometers.

M10-EN.10.4 Asbestos Exposure

Asbestos is a mineral-based material that is widely used. It is resistant to heat and corrosive chemicals. Asbestos appears as a whitish, fibrous material which may release airborne fibres, that can cause health damage, may be too small to see with the naked eye. If inhaled, these fibres can cause:

- asbestosis (scarring of the lungs resulting in loss of lung function that often progresses to disability and to death)
- mesothelioma (cancer affecting the membranes lining of the lungs and abdomen)
- lung cancer and cancers of the oesophagus, stomach, colon, and rectum

Asbestos is commonly found in old buildings, can be found in many items such as:

- boiler insulation
- pipe insulation
- cooling towers
- floor tile/ceiling tile
- electrical wiring insulation
- wall board or stucco compounds

Potential Hazard

Maintenance workers and engineers can be exposed to asbestos without knowing it, from many possible areas and sources. Exposure can occur during their work in furnace rooms where boilers are insulated with asbestos, or while repairing old piping or while doing minor renovations. Asbestos exposures can also occur when insulation in old buildings is removed during renovations. Asbestos exposure is often associated with areas or items that might not be expected to contain asbestos. Very often, maintenance personnel are unaware and untrained to handle these hazards.

Safety Precautions

Employers are required to:

- Place signs at entrances to mechanical rooms/areas containing asbestos where employees may enter
- Follow any permissible exposure limits that exist
- Provide an asbestos awareness training course to those performing housekeeping activities in an area containing asbestos
- Provide appropriate respirators, protective clothing, exposure monitoring, hygiene facilities and practices, warning signs, labelling, record keeping, and regular medical examinations

It is very important that only fully trained personnel can remove asbestos using proper methods and PPE. When asbestos fibres are exposed, they present a hazard and should be removed or encapsulated in such a way that they will not be released

M10-EN.10.5 Welding Fumes

Maintenance employees are exposed to welding hazards and fumes when they repair equipment. Welding fumes contain particulate matter and gases and can be hazardous for workers especially if welding is done in confined spaces. It is also possible to cause flash burns to skin and eyes. Numerous health hazards exist, associated with exposure to fumes, gases and ionizing radiation formed or released during welding, cutting and brazing, including heavy metal poisoning, lung cancer, metal fume fever, flash burns, etc. These risks vary depending upon the type of welding materials and welding surfaces.

Safety Precautions

Employers must provide their employees with proper protective eyewear and clothing. When maintenance in confined spaces, local exhaust or general ventilating systems shall be provided and arranged to keep the amount of toxic fumes, gases, or dusts in low concentrations.

M10-EN.10.6 Fire Safety

Potential **fire hazards** for employees in engineering:

- Heat-producing equipment
- Storage of flammable chemicals
- Faulty electrical wiring

(Link: M10-EN.9.8.)

M10-EN.10.7 Machine Guarding

Maintenance employees can be exposed to possible amputations and strangulations during maintenance, if no machine guards exist.

Safety Precautions

- Use two-handed tripping devices
- Use electronic safety devices

Employers must place machine guards on equipment (provide barrier guards over dangerous equipment for preventing hazards of strangulation or amputations).

M10-EN.10.8 Electrical Safety (Link: M10-EN.3.6)

Possible electric shock and contact with electrical hazards can occur from:

- Maintenance equipment and machinery
- Using damaged receptacles and connectors
- Ungrounded electrical service near sources of water

M10-EN.10.9 Lockout/Tag out

Employees can be injured during the service or maintenance of machines or equipment from an unexpected release of hazardous energy.

Safety Precautions

Turn off and disconnect from energy source machines or equipment prior performing service or maintenance on them, as well locked out /tagged out the energy-isolating device properly. Relieve or control any stored energy.

M10-EN.10.10 Noise

The noisiest departments in a health care facility are food service areas, laundries and engineering areas (where the boiler room is included).

Noise effects are:

- High blood pressure and decreased circulation in hands and feet (because of the blood vessel constriction)
- Headaches
- Increased irritability
- Difficult communication between co-workers
- Reduced work ability
- Increased difficulty to perform tasks requiring alertness, concentration and attention to detail

Safety Precautions

Employers can introduce a program decreasing noise in the health care facility, as well used for hearing conservation. This program can include:

- Regular measurement of noise
- Hearing test for new employees, and annual audiometric testing for all employees
- Isolation of noisy equipment, installation of protective shields and acoustic ceilings and carpets. Provision as well of proper PPE (for hearing protection)
- Limitation to employees' exposure time to excessive noise