

FACT SHEET

PREVENTING LEGIONNAIRES' DISEASE: RESPONSIBILITIES FOR EMPLOYERS, BUILDING OWNERS AND OPERATORS

This fact sheet explains how people can get Legionnaires' disease from cooling towers, air conditioning and hot water units. It also provides advice for employers, building owners and operators on how to prevent this serious illness.

WHAT IS LEGIONNAIRES' DISEASE?

Legionnaires' disease is a form of pneumonia. It can be mild, or severe enough to cause death. Patients usually need hospital treatment, and sometimes intensive care.

WHAT CAUSES LEGIONNAIRES' DISEASE?

A bacterium called *Legionella* causes Legionnaires' disease. It lives in water and soil, depending on its species. In New Zealand:

- > *Legionella pneumophila* lives in hot water units and cooling towers
- > *Legionella longbeachae* lives in soils, compost and potting mixes.

Legionella pneumophila grows on the wet surfaces of air conditioning cooling units for buildings and other industrial cooling equipment and scrubbers. It grows more quickly if biofilms¹ are present.

Examples include cooling units in the following industries:

- > food processing
- > plastic moulding machinery
- > plants that use emission control scrubbers to prevent air contaminants from releasing into the environment
- > cooling units for computer rooms or telephone exchanges.

Legionella also thrives in pools of water. It grows quickly in water temperatures between 20°C and 50°C. It does not grow in water over 60°C.

Legionella can become airborne when fine water droplets are expelled from cooling towers or scrubbers. The bacteria spreads on the wind and may affect nearby members of the public. Poorly positioned air intakes for air conditioning units can also capture the bacteria and send them inside buildings.

WHO COULD GET LEGIONNAIRES' DISEASE?

Some people are more at risk than others of getting Legionnaire's disease. Adults over 50, smokers, people with lung disease or low immunity are more vulnerable.

¹ Biofilms exist when bacteria grow in a watery environment. They excrete a substance that makes them stick to surfaces.

Note: Legionnaires’ disease is not contagious. Outbreaks stay within the local region.

Legionnaires’ disease is a notifiable disease. This means a doctor must tell the local Medical Officer of Health if he or she suspects a patient has Legionnaires’ disease, or when they have diagnosed a patient with it.

TAKING PRACTICABLE STEPS TO PREVENT *LEGIONELLA* GROWTH

Building owners, industrial cooling plant operators, and employers of people who work in buildings with cooling towers can take practicable steps to prevent this disease.

<p>1. Choose a water cooling unit that reduces <i>Legionella</i> growth</p> <ul style="list-style-type: none">> Use an air-cooled system instead of a cooling tower. <i>Legionella</i> cannot grow in water-free environments.> Design or buy plant that is easy to clean and reduces bacterial growth.> Select processes that restrict bacterial growth (for example: a hot water unit with mixing valves instead of a tepid water storage system).> Make sure parts avoid sludge build-up. <i>Legionella</i> grow better in sludge.> Avoid dead legs in pipe work so bacteria cannot grow in them.> Use drift eliminators. They prevent most droplets from leaving a cooling tower.> Provide easy access for maintenance and cleaning.> Use a continuously-operating disinfection process to kill bacteria.> Position air intakes so <i>Legionella</i> ejected from a cooling tower cannot enter the building.> Use a closed-circuit system instead of an open circuit. This removes bacteria growth surfaces.
<p>2. Keep water-handling systems clean</p>
<p>3. Treat the water with chemicals</p> <p>Use specialist advice from a water treatment company for help with:</p> <ul style="list-style-type: none">> selecting and running the chemical dosing equipment> the design of bleed-off techniques to avoid chemical residue build-up> choosing biocides – effectiveness versus ecotoxicity> water sampling and testing<ul style="list-style-type: none">– (Water sampling and testing needs regular quality control. It should comply with AS/NZS 3666.3 <i>Air handling and water systems of buildings – Microbial control – Part 3: Performance based maintenance of cooling water systems</i>)> routine cleaning.
<p>4. Use the approach in AS/NZS 3666.3 for monitoring water quality and interpreting results</p> <p>The standard also describes actions to take when results suggest an increase of microbial growth in the water.</p>

Table 1: Taking practicable steps to prevent *Legionella* growth

These steps are needed in most circumstances when commissioning buildings, buying cooling equipment or selecting building space for employee occupation. The employer must decide which steps are practicable to take, depending on the risk posed by the legionellosis hazards.

At some point, a water cooling system will need replacing. When this occurs, the employer should specify a system that does not use wet cooling towers.

Advice from specialists can help the people responsible make informed decisions. Contact the Institute of Refrigeration, Heating and Air Conditioning Engineers (IRHACE) for a list of specialists in air conditioning and cooling. See www.irhace.org.nz.

BUILDING AND PLANT OWNERS, OPERATORS AND EMPLOYERS: TAKING PRACTICABLE STEPS TO CONTROL *LEGIONELLA* GROWTH

Building and plant owners, employers and cooling plant operators have different duties for controlling *Legionella* growth.

PERSON WITH RESPONSIBILITIES	RECOMMENDED ACTIONS
Building owners	should make sure they receive monthly reports on water quality and that they understand the results (see AS/NZS 3666.3 and the <i>New Zealand Building Code</i>). They should be able to display a history of ongoing compliance to local authorities and health and safety inspectors.
Employers	should confirm the air conditioning is safe by viewing a copy of the monthly water quality report or asking the building owner to report by exception.
Cooling plant operators	should confirm the cooling equipment is safe. There are many similarities between air conditioning units and cooling towers, therefore WorkSafe New Zealand recommends monthly sampling and water quality reporting.

Table 2: Recommended actions for building owners, employers and cooling plant operators

In addition, employers should:

1. ask for a condition report or specification on the air conditioning system or cooling equipment's safety and health
2. check the system's maintenance programme
3. periodically check the water quality. The final safety check is testing for microbial growth in cooling water.

FURTHER INFORMATION

For further information about Legionnaire's disease from soil, see *Legionnaires' Disease: What you Should Know if you Work with Soil, Compost and Potting Mix*. Available from WorkSafe New Zealand at www.worksafe.govt.nz keyword search: legionellosis.

Building Performance at the Ministry of Business, Innovation and Employment: www.building.govt.nz keyword search: legionellosis.

Compliance documents on ventilation standards are available at www.building.govt.nz/compliance-documents

The Prevention of Legionellosis in New Zealand: Guidelines for the Control of Legionella Bacteria. Available from the Ministry of Health at www.health.govt.nz.

NSW Code of Practice for the Control of Legionnaires' Disease. Available from the New South Wales Department of Health at www.health.nsw.gov.au.

The following standards are available from Standards New Zealand at www.standards.co.nz:

- > AS/NZS 3666.3 *Air handling and water systems of buildings – Microbial control – Part 3: Performance-based maintenance of cooling water systems*
- > NZS 4302 *Code of practice for the control of hygiene in air and water systems in buildings*
- > AS/NZS 4020 *Testing of products for use in contact with drinking water*

AS 2345 *Dezincification resistance of copper alloys*. Available from SAI Global at www.saiglobal.com/search-publications/