

# LEGIONELLA CONTROL IN WATER COOLING TOWERS

## Information Sheet

January 2014

This information sheet provides general information on the control of *Legionella spp.* bacteria in water cooling towers.

### Types of water cooling towers

Evaporative water cooling towers are used to remove heat from water in industrial process cooling systems, refrigeration and some air conditioning systems.

### Water cooling towers and Legionella bacteria – Hazards and risks

Cooling towers, because of their mode of operation, can create ideal conditions for microbial growth and they also deliberately require the creation of sprays and aerosols, which can be dispersed over a wide area if not controlled properly. Those at risk of exposure, include not only those who work in the premises but also others in the vicinity including members of the public. Employees involved in cleaning or maintenance may be at increased risk.

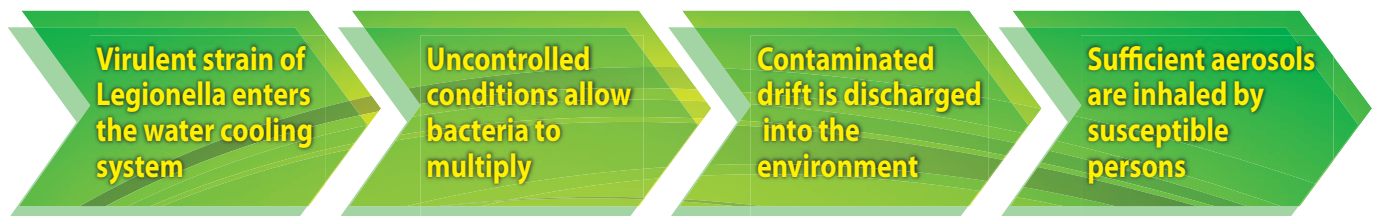


They are found in many different places of work from food or pharmaceutical processing plants to hotels or offices. Towers can have an open or closed circuit or a combination of both, they can be either induced or forced draught type, with a counter or cross-flow of air relative to the water flow.



Cooling towers operate at temperatures which can provide an environment for the growth of microorganisms in the water (20-45°C), including *Legionella*. A specific strain of legionella bacteria (*L. pneumophila*) can cause a Legionellosis infection in susceptible individuals and presents the most serious hazard. If the water is allowed to become heavily contaminated and to escape from the unit in aerosol form and is then inhaled by susceptible persons in the vicinity, cases of Legionellosis may result.

The presence of *Legionella spp.* alone should not be regarded as a cause for alarm, the bacteria are commonly found in both natural water sources and artificial water systems. It is only when levels proliferate in favourable conditions (nutrients are available and the water is stagnant), that problems arise.



The ideal conditions for growth of *Legionella spp.* in water include:

- ✓ A high microbial concentration, including algae, amoebae, slime and other bacteria
- ✓ Presence of biofilm, scale, sediment, sludge, rust or other organic matter
- ✓ Presence of degraded plumbing materials, such as rubber fittings, which may provide nutrients to enhance bacterial growth

*Legionella spp.* and *L. pneumophila* are listed among biological agents set out in the First Schedule of the Code of Practice for the *Safety, Health and Welfare at Work (Biological Agents) Regulations, 2013 (S.I. No 572 of 2013)* and are categorised as a 'group 2 biological agent', that is "one which can cause human disease and might be a hazard to employees, although it is unlikely to spread to the community and in respect of which there is usually effective prophylaxis or treatment available".





### What preventive measures should be taken with water cooling towers in the workplace?

Exposure can be avoided completely by paying close attention to the mechanical design of the equipment, by using chemical treatment to maintain good water quality and system cleanliness. An important element of the design is the need for high efficiency *drift eliminators* to minimise the water droplets and

aerosols discharged into the atmosphere.

The routine microbiological monitoring of the general aerobic heterotrophic bacterial count (total viable count (TVC)) is an important indicator of whether microbiological control is being achieved. This should be routinely undertaken for cooling towers.

### Key points for employers

An employer must ensure a safe working environment where exposure to *Legionella* bacteria is prevented or controlled. The employer should have or provide the following:

- ✓ A written site specific risk assessment for *Legionella* control in the system
- ✓ Adequate control measures to control *Legionella* growth
- ✓ Information, training and instruction to employees
- ✓ Commissioning and regular maintenance of the cooling equipment
- ✓ Supervision
- ✓ Appropriate records

## Key points for employees

Employees are entitled to information about hazards in the workplace and information contained in the employer's risk assessment. Employees who are likely to work with and have the potential to be exposed to high levels of legionella bacteria need information, instruction and supervision so that they know and understand the following:

- ✓ Results of the risk assessment
- ✓ Need to report any failures in control measures
- ✓ Risks to health

## What legislation is applicable to water cooling towers in the workplace?

### Commissioning:

Safety, Health and Welfare at Work (Construction) Regulations, 2013 (S.I. No 291 of 2013) [Part 9 General Health Hazards, Schedule 1 & Regulations 14, 15 and 16]

### Maintenance:

Safety, Health and Welfare at Work Act, 2005 (S.I. No 10 of 2005) Section 8 & 12

Safety, Health and Welfare at Work (General Application) Regulations, 2007 (S.I. No. 299 of 2007). Regulations 29 & 30 maintenance of work equipment

Safety, Health and Welfare at Work (Biological Agents) Regulations, 2013 (S.I. No. 572 of 2013)

Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001 (S.I. No 619 of 2001)

## Where can I get further information?

You can obtain related document below by downloading information from HSA publications webpage: [www.hsa.ie](http://www.hsa.ie)

- Biological Agents Code of Practice
- Biological Agents Guidelines
- Legionnaires Disease Information Sheet
- Your Steps to Chemical Safety
- Safety in Contract Cleaning

## Other useful sources of information on Legionella control:

- Health Protection Surveillance Centre (HPSC) National Guidelines for the Control of Legionellosis in Ireland. Available from: [www.hpsc.ie](http://www.hpsc.ie)
- EUROVENT 9/7 Recommended Code of Practice to Keep your Cooling System Efficient and Safe. Available from: <http://www.eurovent-association.eu>
- European Agency for Safety and Health at Work: <https://osha.europa.eu/en/publications/factsheets/100>

For further information please contact the HSA workplace contact unit on 1890 289 389 or email: [wcu@hsa.ie](mailto:wcu@hsa.ie).