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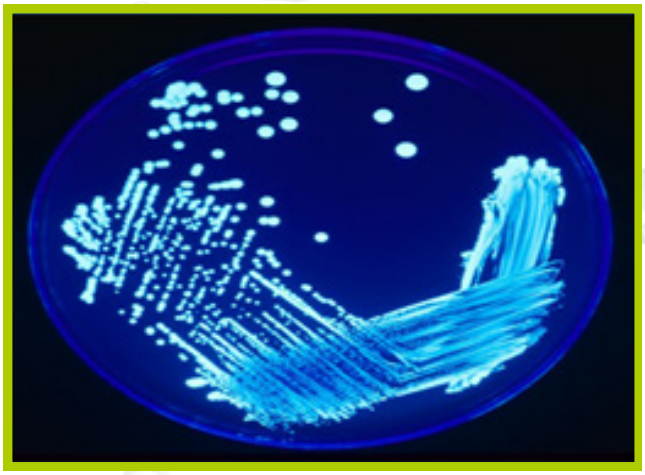
The control of Legionella bacteria in water systems

Legionella - The Disease

There are at least 50 species and 70 serogroups of Legionella.
It causes respiratory illness which ranges from mild flu (Pontiac Fever) through to potential fatal pneumonia (Legionnaires Disease).
Legionella is found everywhere in the environment and is commonly found in environmental waters and potable mains water.

The person responsible for the water services and related equipment within the workplace will be most likely to be held responsible in the event of the death or serious illness of any individual caused by exposure to the bacteria.



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Legionella - The Bacteria

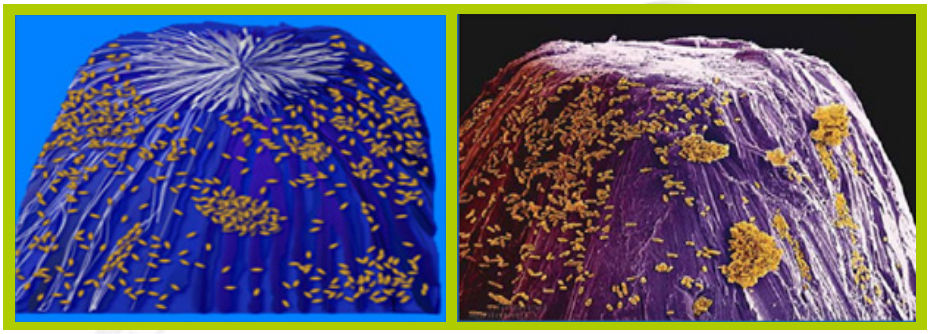
Unless control measures are conducted properly and routinely, the biofilm, scale, and corrosion that build up over time in these systems will protect the organism and provide nutrients to allow it to multiply.

Legionella is able to survive under a wide range of environmental conditions. It has been found in water temperatures ranging from 6°C – 60°C, but grows best between 20°C - 45°C.
The organism will not multiply at temperatures below 20°C and will not survive above 60°C.
Below 20°C the bacteria may remain dormant and start to multiply if the temperature warms up.

Legionella growth is aided by nutrients which can be obtained from other bacteria in the water, algae and amoebae.
Sediment, sludge, scale and biofilms also play an important role in harbouring and providing suitable conditions in which Legionella may grow. Biofilms can be important in protecting Legionella from adverse temperatures and biocides within a system.

As the organism grows so readily in waters including manufactured water systems it is important to control the risk by preventing the proliferation of the bacteria within a water system, and as far as possible, reduce exposures to water droplets and aerosols.
Under ideal conditions some bacteria are able to multiply every 20 minutes.

The two pictures below are bacteria on the head of a pin.



Biofilm

Scale

Corrosion

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Legislation

The Approved code of practice for controlling Legionella is called 'Legionnaires' Disease. The Control of Legionella bacteria in water system' or ACOP L8 (New Edition 2013/14), which is the Health and Safety Executive's approved code of practice.

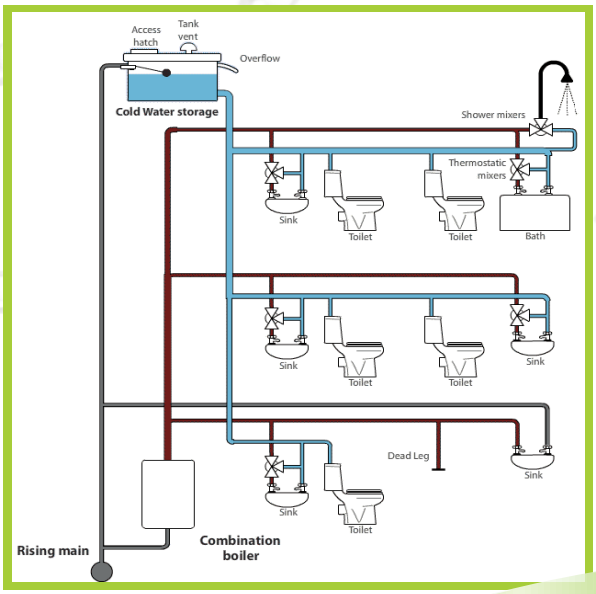
This can be viewed at:
http://www.hse.gov.uk/pubns/books/l8.htm

ACOP L8 applies to any place where work, trade or business is undertaken, where water is used or stored and where there is a means of creating and transmitting water droplets which may be inhaled,there by causing a foreseeable risk of exposure to Legionella.

Hot and cold water systems

A water system includes all plant/ equipment and components associated with that system.

This will include all associated pipe work, pumps, feed tanks, valves, showers, heat exchangers etc.



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Contributing factors

Corroded, wrongly sized tanks, unnecessary water storage tanks, badly designed systems and pipework (dead legs/ blind ends), dirty contaminated water storage tanks also water storage tanks that do not conform to current water regulations.

Photographs showing images of dead legs/ blind ends.

Photographs showing before and after a tank clean.

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Controlling the risk

Step 1: Identification and assessment of the risk

A full site inspection (risk assessment) is carried out in order to identify all of the water services and establish their general condition.
A full asset register and schematic system plan is also prepared at this stage. The risk assessment should be regularly reviewed and amended as necessary.

Step 2: Initial remedial work

Where the risk assessment has highlighted areas of specific concern such as contaminated tanks, poor pipework design etc must be rectified without delay.

Step 3: Managing risk

An on going monitoring scheme should be implemented and carried out by a competent person.

Step 4: Record Keeping

All aspects of the Legionella control scheme should be recorded in written form, this includes written details of the scheme itself, system plans or schematic drawings, names of responsible persons, all test results and dates and the current state of the opperation of the system. The nominated person is usually a director or a manager who has similar authoirty.

Purewater Enivrionmental Services Ltd can provide specialised services to ensure a clean water supply and that tanks and associated pipework meets current water regulations such as:

- Legionella risk assessments including schematic drawings if required
- Annual tank inspection, clean and chlorination
- Microbiology analysis - Water sampling via UKAS approved laboratories
- Full building flushes and mains injections
- Commissioning of booster sets
- Upgrading existing water storage tanks included
- Full turnkey tank replacement
- Servicing of water softeners and booster sets
- Replacement of hollow roof support struts
- Insulating of existing cold water storage tanks

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