



Closed Loop Water Systems

Legionella Risk and Control

Risk and Control of Legionella in closed loop water systems

Growth of Legionella bacteria

Legionella bacteria can proliferate in water systems with conditions that favour the bacteria. These conditions can exist within LTHW and Chilled water systems. These conditions are summarised below for each type of system.

LTHW:

These systems are typically used for space heating via AHU's, FCU's or radiators

Legionella bacteria can enter these systems through make up water either on initial filling or replenishing water lost through leaks or maintenance works.

When in normal use the temperatures are generally in excess of 50°C and so Legionella bacteria will be killed off making these systems low risk, however if the systems have been left off line or had areas without circulation and the systems untreated then it is possible that Legionella bacteria could be present and proliferate. If work is undertaken on these systems when pressurised then small localised quantities of Legionella bacteria could be released into the atmosphere creating a possible small localised risk.

In normal use systems should be treated with inhibitors and biocides to prevent corrosion and bacterial growth

If there are any planned maintenance works then the system should have the pressure released by removing some water through a drain valve being careful not to release aerosols.

If "bleeding" systems through air valves then a cloth should be used over the air release to prevent aerosol production or P3 filter masks worn by the operatives.

If the systems are to be worked on while pressurised and this work may entail the release of aerosols then the systems should be tested for Legionella bacteria and if required P3 filters issued to operatives and the work area restricted. However if the system is operating at 60°C or greater then it is reasonable to assume that the risk is controlled.

Chilled

These systems are typically used for cooling buildings via AHU's and FCU's or equipment and processes.

Legionella bacteria can enter these systems through make up water either on initial filling or replenishing water lost through leaks or maintenance works.

When in normal use the temperatures are generally in the range where Legionella bacteria can proliferate. If work is undertaken on these systems when pressurised then small localised quantities of Legionella bacteria could be released into the atmosphere creating a possible small localised risk.

In normal use systems should be treated with inhibitors and biocides to prevent corrosion and bacterial growth

If there are any planned maintenance works then the system should have the pressure released by removing some water through a drain valve being careful not to release aerosols.

If "bleeding" systems through air valves then a cloth should be used over the air release to prevent aerosol production or P3 filter masks worn by the operatives.

If the systems are to be worked on while pressurised and this work may entail the release of aerosols then the systems should be tested for Legionella bacteria and if required P3 filters issued to operatives and the work area restricted.

Dissemination of Legionella Bacteria:

Legionella bacteria can only cause illness in humans if high enough numbers of the bacteria can be disseminated in an aerosol spray and be breathed in by susceptible people.

Closed loop water systems as the name suggest do not, in normal operation allow the water outside the system to cause any risk from Legionella bacteria making these systems inherently low risk systems.

Control measures should therefore concentrate on circumstances where aerosols could be generated and therefore any risk controlled.

Recommended control measures for Close loop water systems

Table 1.0

Activity	Risk LTHW	Risk Chilled	Control Measure
Planned maintenance work allowing water to be released	If system is operating below 50 C then possible risk or aerosol production	Possible risk of aerosol production	Remove pressure from the system by bleeding water off from drain valve before works
Planned maintenance works allowing water to be released when system under pressure	Aerosol production	Aerosol production	LTHW if system has been operating at >60 C in the last week then no action. LTHW and Chilled: Test system for Legionella bacteria before works and if required treat or wear P3 mask and control works area during any aerosol production.
Bleeding the system	Aerosol production	Aerosol production	Use cloth to prevent aerosol production or wear P3 mask
Emergency works	Aerosol production	Aerosol production	If possible de-pressurise system. Limit aerosol production and if aerosols may be produced restrict work area.
Normal Operation	No aerosol but possible bacterial growth depending on temperature and use	No aerosol but possible bacterial growth	Consider treating systems with inhibitors and biocides