# Coronavirus (COVID-19) – Legionella advice: lockdown risks and reopening safely

All employers, business owners and landlords have a legal duty under health and safety law to assess the risks from Legionella bacteria and ensure effective controls are in place to manage the risk.

There is an increased risk of Legionella bacteria being present as a consequence of the conditions that lockdown may have created. When buildings reopen after lockdown, it is essential that water systems are not put back into use without considering the risks of Legionnaires' disease.

This guidance will help assess this risk and take precautionary measures in hot and cold water systems typically found in buildings. Guidance is also provided on controlling risks from other sources.

## Lockdown risk factors and control measures during this period

A combination of warm external temperatures and low use of water systems during lockdown will give rise to an increased risk of conditions in which Legionella bacteria can grow.
Legionella bacteria thrive at temperatures between **20°C and 50°C**, therefore one of the key control measures for minimising the risk is to ensure that cold water is cold (i.e. below **20°C**) and the hot water is hot (above **50°C**). When water is below 20°C or above 50°C Legionella bacteria will not grow. However, water between these temperatures presents a greater degree of risk, particularly where it is left to stagnate. There will also be nutrients in the system for the bacteria to grow, such as corrosion, limescale, biofilm and sediment. Generally, where water is left within a system without movement for more than a week then the risk of growth will increase.

Ideally, the risk from Legionella will have been considered at an early point in planning lockdown arrangements, to ensure additional control measures were in place to manage the risk during the lockdown. However, where this is not the case, the risk now needs to be considered particularly if it is foreseeable that buildings and water systems may remain shut down or subject to low usage for several weeks. Where conditions for Legionella bacteria growth exist, there is always an opportunity to put measures into place to reduce the risk.

For simple hot/cold water systems, a review should be straightforward. The main objectives should be to prevent stagnation and keep water temperatures outside of 20-50°C. If possible, aim to ensure the turnover of any water stored in tanks every 24

hours and movement of water through pipework and outlets at least once a week to prevent it from becoming stagnant.

If this cannot be achieved because the building is closed, or there is significantly reduced use, additional steps need to be taken. This may include flushing the entire water system (all outlets) weekly and, if possible, dropping the level of stored water in tanks.

If hot water systems are switched off to conserve energy, ensure water stored in any associated tanks is also turned over within 24 hours. Regular temperature checks across the water system at various outlets as described in HSG274 Part 2 – The Control of Legionella Bacteria in Hot and Cold Water Systems will assist in confirming that water is not warming up to a point at which Legionella growth may occur, and demonstrate that stagnation is being prevented if they are typically satisfactory and consistent across the system.

## Advice for reopening

If the Legionella risk assessment has already been reviewed during lockdown and effective additional control measures have been implemented during the period, then it is unlikely that any further steps will need to be taken prior to reopening. A building is more likely to be safe to reopen without additional measures if:

- Flushing of the water systems has been undertaken weekly
- Water temperatures at outlets have been checked and are consistently in line with HSG274 Part 2 – The Control of Legionella Bacteria in Hot and Cold Water Systems.
- Any microbiological sampling undertaken over the course of the lockdown indicates no significant change in the total viable count (TVC) and Legionella bacteria samples have returned as not detected or satisfactory

Where no additional action has been taken during lockdown, or there are concerns about the effectiveness of controls implemented, reasonable steps must be taken to ensure the safety of the water system prior to reopening. It is foreseeable that some increase in bacterial levels will have occurred. Such water systems should not simply be put straight back into use and a plan should be formulated to allow safe start-up prior to reopening the building.

Any plan should consider the competency and health and safety of individuals carrying out the work. The hazards from Legionella bacteria will likely be greater than expected under normal conditions so measures such as limiting the production of water droplets (aerosol), minimising exposure to those droplets and even use of respiratory protective equipment should be considered.

Where there are concerns, for example, there is a history of Legionella in the water system, external advice should be sought from a competent person who may be able to assist remotely or through attendance on site.

Additional steps to take prior to reopening could include:

- Flushing through simple hot/cold water systems with fresh mains water for several minutes
- Increasing the temperature of hot water systems to above 60°C if possible and drawing it through to all hot water outlets (a temperature over 60°C will kill Legionella bacteria over time)
- Flushing through larger hot/cold water systems (including those with tanks, showers, calorifiers etc.) for a significant period of time
- Undertaking a chemical or thermal disinfection of the water system
- Undertaking microbiological sampling for Legionella bacteria

*Note – increasing the water temperature to 60°C and above can result in a scalding risk. While water should be stored at 60°C, there should be a thermostatic mixing valve before the tap to reduce the temperature to around 43°C. This is especially important in settings such as nurseries, play centres, care homes and day centres to protect vulnerable groups.*

Flushing taps can generate water droplets, so plan in advance how this can be done safely. This could include running taps at low velocity or flushing shower heads into a part filled container of water, ensuring that the showerhead is submerged under the water in the container.

System disinfections take significant time and are typically undertaken with chlorine at harmful levels. They will likely require specialist assistance from a water treatment contractor. As their services may be in high demand, they need to be contacted as soon as possible if disinfection may be required.

Microbiological sampling could assist in determining the degree of risk any water system currently poses and demonstrate whether any steps taken have been effective. It will require specialist assistance from a water treatment contractor. Such sampling should be undertaken 48 hours after any flushing and disinfection and may need to be repeated a few weeks later to ensure that effective controls are being maintained.

Each individual water system within a building or workplace is likely to need some degree of individual consideration as no two systems are entirely alike.

## **Practical advice on how to reduce risks from Legionella:**

Temperature regime

- Keep  water stored at 60°C
- Distribute water so that it reaches 50°C within 1 minute at the outlets (55°C in healthcare premises)
- Cold water stored in tanks at less than 20°Cold
- Cold water taps at outlet should be less than 20°C after running for 2 min

- Temperature control methods: < 20°C – bacterium is dormant; > 20°C- 45°C – bacterium multiply rapidly; 50°C - 90% bacterium killed within 2 hours; 60°C – 90% bacterium killed within 2 min; 70°C – rapid kill 100%

Low occupancy buildings

- Continue normal flushing of outlets as per risk assessment, but include low use outlets
- Consider opting for twice weekly flushing of outlets as a short-term measure to increase water turnover
- Where access to buildings is difficult to carry out checks, e.g. care homes, nurseries, consider taking flow and return temperatures from the calorifier / hot water storage vessel and sentinel outlets only to minimise footfall by contractors
- Where there are in-house maintenance staff, continue to take monthly temperatures
- Act on any non-conforming temperatures

Mothballed buildings – start-up procedure

- Two to three weeks prior to occupation, consider conducting building chlorination, especially where cold water storage tanks are in place. Water has been stagnant and may have suffered thermal gain (>20°C)
- Consider sampling for Legionella. This needs to be taken at least two to three weeks before building occupation to give time to take any action
- If quarterly showerhead cleaning and disinfection was due within the shutdown period, bring this up to date

Mothballed buildings – 2-3 days before occupation

- Raise the temperature of the calorifier / hot water storage vessel to 60°C and run water through to all associated outlets
- Flush and purge all outlets until temperature at the outlet stabilises and is comparable to supply water and purge to drain
- Once flushing of all outlets has started, it should be continued until all outlets are back in regular use

Additional actions

- Document all key actions
- Update the Written Control Scheme / Legionella procedures
- Review Legionella risk assessment if building use has changed

Further guidance:

- Legionnaires' disease. The control of legionella bacteria in water systems - Approved Code of Practice and guidance (L8 ACOP)
- Legionnaires' disease - Technical guidance (HSG274 Part 2) (PDF)

## Cooling towers and evaporative condensers

Dutyholders should already have reviewed operations in advance and have existing plans in place to ensure safe systems of work continue during any shutdown. This includes ensuring:

- Adequately trained personnel are available to carry out essential checks and monitoring

- Chemical supplies are maintained and dosed appropriately

If cooling towers and evaporative condensers are likely to be out of operation for:

- **Up to a month** - isolate fans, but circulate biocidally-treated water around the system for at least an hour each week
- **More than a month** - drain down the systems and clean and disinfect them. Clean and disinfect the systems again before refilling and returning to operation

Further guidance:

- Legionnaires' disease. The control of legionella bacteria in water systems - Approved Code of Practice and guidance (L8 ACOP)
- Legionnaires' disease - Technical guidance (HSG274 Part 1) (PDF)

## Air conditioning units

If the workplace has been closed for an extended period and has air conditioning units that have a source of water that can generate aerosol, they will need to be assessed for the risk of Legionella before restarting.

Small wall or ceiling-mounted units with closed cooling systems should not present a risk.

Larger units may present a risk if they have improperly drained condensate trays, or humidifier or evaporative cooling sections where water can stagnate, becoming a reservoir for bacteria to grow.

When the risk assessment is reviewed, decide what the risks are for the units and if they need to be cleaned safely, before they are turned on.

## Commercial spa pools and hot tubs

If commercial spa pools and hot tubs are:

- being used, then maintain the existing control regimes

- not being used, then drain, clean and disinfect them. They should also be cleaned disinfected before reinstatement.

Further guidance:

- Legionnaires' disease. The control of legionella bacteria in water systems - Approved Code of Practice and guidance (L8 ACOP)
- Control of legionella and other infectious agents in spa-pool systems (HSG282

**Additional sources of information**

- The Health and Safety Executive has produce guidance on managing Legionella risks during the COVID-19 outbreak:

  https://www.hse.gov.uk/news/legionella-risks-during-coronavirus-outbreak.htm

- The Legionella Control Association has published guidance on managing water systems during the COVID-19 outbreak.

- The European Society of Clinical Microbiology and Infectious Diseases (ESCMID) Study Group for Legionella Infections (ESGLI) has also published guidance for managing Legionella during the COVID-19 outbreak.