MANAGING THE RISK OF LEGIONELLA DURING THE COVID-19 PANDEMIC

How is Legionella spread?

Legionella bacteria can thrive in warm water systems, especially those at a temperature of 20°C - 45°C. It becomes riskiest where there is a chance of people inhaling droplets of infected water. In hotels and leisure centres, this means there can be many potentially risky facilities, including:

- Spas and whirlpool baths
- Ornamental fountains
- Humidified food displays
- Showers and taps
- Turkish baths and saunas
- Steam rooms
- Cooling towers and evaporative condensers for air-conditioning (even if situated on the roof or in the grounds of the leisure centre)

Where can Legionella bacteria survive and multiply?

- In water at temperatures from 20°C - 45°C
- In hot and cold-water tanks or cisterns
- In pipes with little or no water flow (this includes unoccupied rooms)
- In slime (biofilm) and dirt on the inner surfaces of pipes and tanks
- On rubber and natural fibres in washers and seals
- In water heaters and hot water storage tanks
- In scale and corrosion in storage vessels, pipes, showers and taps
- In firefighting systems, e.g. sprinklers and hose reels
- In recirculating water in spa pools
- Behind the tiles of swimming pools if the waterproofing material lining the pool has been compromised due to the modification of its design e.g. addition of a bench.

These conditions encourage the growth of Legionella and increase the risk of infection to guests and staff.

Managing the risk

Under normal circumstances, hotels and leisure centres need to consider times of greater risk such as seasonal fluctuations in occupancy rates- where water in pipes or tanks may sit unused for long periods of time thus allowing Legionella to take a hold- or when there is a high turnover of guests, potentially exposing a greater number of people to the risk of an outbreak of Legionnaires disease.

Under exceptional circumstances- such as during forced shutdown of hotel and leisure centre premises as a result of the COVID-19 outbreak- it is imperative that the risk of Legionella is managed tightly.

The first priority is to appoint a named person responsible for Legionella control. S/he will need to be trained to oversee a regime that:

- Keeps water hot and circulating
- Keeps shower heads and taps clean and scale-free
- Cleans and disinfects all water filters regularly
- Inspects water storage tanks and pipes regularly
- Treats high-risk facilities such as spa pools with chlorine or bromine and disinfects them regularly
- Cleans and disinfects cooling towers regularly
- Runs taps in unoccupied rooms at least once weekly
- Test regularly for Legionella bacteria

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A 15-Point Plan for reducing the risk of Legionella

The risk of Legionnaires disease can be minimised by putting in place a clear 15-Point Plan. Hoteliers and Leisure Centre owners are recommended to adhere to the following:

1) Have one named person responsible for Legionella control.
2) Ensure the named person has sufficient training and experience to be able to carry out the role competently and other staff are trained to be aware of the importance of their role in controlling Legionella.
3) Keep hot water hot and circulating at all times: 50°C - 60°C (too hot to put hands into for more than a few seconds) throughout the entire hot water system.
4) Keep cold water cold at all times. It should be maintained at temperatures below 20°C throughout the system to all outlets (this may not be possible when the ambient temperature is high, but every effort should be made to ensure that cold water entering the premises and in storage remains as cold as possible).
5) Run all taps and showers in guest rooms and other areas for several minutes to draw through water (until it reaches the temperatures stated in points 3 and 4) - at least once a week if rooms are unoccupied, and always prior to occupation.
6) Keep shower heads and taps clean and free from scale.
7) Clean and disinfect cooling towers and associated pipes used in air conditioning systems regularly - at least twice per year.
8) Clean, drain and disinfect water heaters (calorifiers) once per year.
9) Disinfect the hot water system with high level (50mg/l) chlorine for 2–4 hours after work on the system and water heaters, and before the beginning of every season.
10) Clean and disinfect all water filters regularly, as directed by the manufacturer, at least once a month.
11) Inspect water storage tanks, cooling towers and visible pipe work monthly. Ensure that all coverings are intact and firmly in place.
12) Inspect the inside of cold-water tanks at least once per year and disinfect with 50mg/l chlorine and clean if containing a deposit or otherwise dirty.
13) Ensure that when carrying out system modifications or new installations they do not create pipework with intermittent or no water flow, and disinfect the system following any work.
14) If there is a spa pool (also known as whirlpool spas, 'Jacuzzis', spa baths) ensure that:
− it is continuously treated with 2–3mg/l chlorine or bromine and the levels and pH are monitored at least three times per day;
− at least half of the water is replaced each day;
− sand filters are backwashed daily;
− the whole system is cleaned and disinfected once per week.
15) Keep daily records of all water treatment readings, such as temperature, pH and chlorine concentrations and ensure they are checked regularly by the manager.

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Precautions

Maintenance, cleaning, and operating procedures should be designed to control the risks to staff and others who may be affected. Personnel involved in flushing procedures should be adequately trained in safety procedures including the use and maintenance of PPE.

FLUSHING PROCEDURE

Water within the system may stagnate because an outlet is not used for more than a week.

How to flush

The frequency and duration of flushing procedures should be based on a risk assessment. Only run showers/ toilets that are intermittently used. All outlets should be flushed at least once per week at full flow (the water flow should be increased gradually to minimise the production of aerosols). Please note that this applies to kitchens, restaurants, bars etc.

The duration of flushing should be based on a risk assessment but at a minimum the procedure below should be followed:

Showers

Run showers for six minutes weekly as follows:

- Run cold for three minutes
- Run hot for three minutes once water is hot.

Toilets

- Flush at least once a week

Taps

Run individual hot and cold taps weekly as follows:

- Run cold for three minutes
- Run hot for three minutes once water is hot.

Mixer taps

- Run with the lever in the coldest position for three minutes weekly
- Run with the lever in the hottest position for three minutes weekly
- Ensure that hot water comes out hot when in the hot position and cold when in the cold position.

Service	Task	Frequency
Intermittently used outlets	Flush for several minutes Where there is difficulty with weekly flushing, flush through and purge to drain immediately before use. Avoid the production of aerosols.	Weekly Before use
Hotels/accommodation	Run all taps and showers in every bedroom whether occupied or unoccupied for several minutes Flush cisterns once	Weekly Weekly
Emergency showers and eye wash sprays. Eye wash sprays should be on an independent water reservoir	Flush through and purge to drain	Quarterly or more frequently if recommended by manufacturers

CLEANING & DISINFECTION

Showerheads

Dismantle, clean and descale showerheads and hoses on a monthly basis. Disinfectants containing chlorine can be used to disinfect showerheads. However, chlorine concentrations vary in different products. Proprietary bleach can lose some of the chlorine over time so newly-manufactured bleach should be used if possible. Thick bleach solutions should never be used for disinfection purposes as they contain potentially poisonous additives.

A solution of **1,000 parts per million (ppm)** of free available chlorine for 10-15 minutes should be used to disinfect showerheads.

Preparation of chlorine disinfectants used for disinfecting showerheads

Proprietary bleach (4% free available chlorine)	
Volume of water to which chlorine is added	**1,000 ppm**
5 litres water	Add 125 ml bleach
10 litres water	Add 250 ml bleach
50 litres water	Add 1,250 ml bleach
Liquid pool chlorine (with 12.5% free available chlorine – concentrations are based on 10% free available chlorine)	
5 litres water	Add 50 ml bleach
10 litres water	Add 100 ml bleach
50 litres water	Add 500 ml bleach
Granular chlorine (with 65% free available chlorine)	
5 litres water	Add 8 g bleach
10 litres water	Add 15 g bleach
50 litres water	Add 77 g bleach

Procedure

a. Set up hazard warning signs at access points to the washroom area if the work site is open to the public or general staff. If possible, showerheads should be removed from the area for cleaning at a designated point

b. The following PPE is required: standard overalls, gloves and goggles/face shield. In areas where there is a significant risk, PPE and respiratory filter masks should be worn

c. Transfer only small quantities of the required treatment chemicals to the area

d. **Routine**

- Remove the showerheads to be cleaned. If flexible hoses are used, they should be included in the cleaning routine
- Dismantle the heads as far as possible
- Place the fittings into the cleaning product*, physically clean as required to remove scale and any other deposits
- Rinse seals and fittings thoroughly with fresh water (this is important to avoid potentially dangerous fumes from reactions with the disinfecting solution)
- Place the fittings in a disinfecting solution* (hypochlorite at 1,000 ppm for 10-15 minutes)
- Rinse seals and fittings thoroughly with fresh water
- Reassemble the showerhead
- Re-fit the showerhead
- Flush the whole showerhead assembly
- Document the showerhead cleaning record.

** Some showerhead materials require specific cleaning and disinfecting chemicals to avoid damage of the fitting, examples include gold plated and thin chrome plated fittings (see manufacturer's advice).*

Spa Pools

Spa pools (also known as spa baths and hot tubs) are increasingly popular in the hospitality field. However, like showers, their very nature makes them a widely recognised legionella risk – their warmer water temperatures of between 30° C and 35° C provide the perfect breeding ground for the bacteria, and agitated water (caused by their jets) leads to aerosol spray which is easily inhaled by those in the pool or in the vicinity. Careful management is needed to ensure there are no health and safety risks.

Control measures for spa pools (whether in use or not) include:

- Regular risk assessments and sampling for contaminants
- Water chlorination treatments to disinfect the water and kill any bacteria
- Inspection of accessible parts to ensure there is no damage that may render the control measures ineffective
- Free chlorine residual of 3-5 mg/l is maintained in the spa pool water or if bromine is used, 4-6 mgs/l of total active bromine. The levels should be monitored each day before the spa pool is used and thereafter at least every two hours
- Replace at least half of the water each day
- Backwash sand filters daily
- Clean and disinfect the whole system weekly
- Keep daily records of all water treatment readings such as temperature and chlorine concentrations and ensure that the manager checks them regularly

Cooling Tower Cleaning and Proper Water Treatment (Trained professional only)

The likelihood of legionella infection can be significantly reduced by good engineering and water treatment practices in the installation, operation and maintenance of air and water handling systems. For this reason, all cooling towers should be treated with a dual biocide program that uses both an oxidizing and non-oxidizing biocide whenever possible. Cooling towers and evaporative condensers should be inspected and thoroughly cleaned at least twice a year. Algae and accumulated scale should be removed. All metal surfaces should be treated with a biocide. Corroded parts, such as drift eliminators, should be replaced. Because of the potential dangers associated with them, all cooling tower cleanings should be done under the supervision of a technician trained in legionella remediation.

Please note that if water systems are out of operation for an extended period of time, a Legionella and Water Hygiene Risk Assessment & Water Sampling test may be required prior to recommission for use.

For further information see:

https://www.hse.gov.uk/healthservices/legionella.htm

https://www.hse.ie/eng/health/az/l/legionnaires'-disease/preventing-legionnaires'-disease.html

https://www.hsa.ie/eng/Publications_and_Forms/Publications/Chemical_and_Hazardous_Substances/Legionaires_Disease.pdf

The Health Protection Surveillance Centre.

The Health and Safety Executive: Code of Practice for the control of Legionnaires' disease

The Health Protection Agency and Health and Safety Executive: Management of Spa Pools: Controlling the risks of infection.