Safe management of water systems in buildings during the Covid-19 outbreak

The ramifications of Covid-19 self-isolation and the lock-down/closure of premises will be the vastly reduced water usage within premises, increasing the risk of legionella and other water-borne bacteria surviving and proliferating within building water systems. Property owners/managers need to take action to reduce the risk of legionella.

Domestic water systems

It is imperative that all hot and cold water outlets (taps, showers, toilet flush cisterns etc.) are subject to a weekly flushing regime to prevent water stagnation. The ACoP L8 recommends flushing of outlets for a minimum of two minutes, but consideration should be given to flushing/purging each hot or cold water outlet for five minutes. Stagnation of water offers suitable conditions for the survival and proliferation of legionella and other water-borne bacteria. Over time these will colonise the water supply system, increasing the likelihood of exposure to legionella bacteria and supplying unwholesome water for consumption on the re-opening of the premises and return to work.

Cold water storage

If the property has cold water storage cisterns (commonly referred to as tanks), then you should consider reducing the stored water capacity commensurate with occupancy. This can be easily achieved by replacing the ball float arm with an extended or angled ball float. This again, is to reduce stagnation of the water supply system.

Hot water systems

If the property has hot water calorifiers or water heaters with storage capacity, you should consider isolating the water and power supply to areas of the premises that are temporarily vacant or void with supply pipework drained down

Consider moth-balling all non-essential water systems within a property were wholly vacant.

Prior to re-occupation, temperature profiles should be undertaken to ensure that both hot and cold water achieve temperatures outlined in the Approved Code of Practice (ACoP) and its supporting Guidance Notes HSG 274 Part 2 for domestic water systems:

- Hot Water: 50 °C to 60°C (after 1 min of flushing).
- Cold Water: Less than 20°C (after 2 min of flushing).
- Thermostatically Mixed Water: 37 °C to 42°C plus or minus 1 degree (at TMV or thermo tap outlet).

Buildings where cooling towers/evaporative condensers are installed (refer to guidance HSG 274 Part 1)

In buildings where cooling towers/evaporative condensers are installed, it is strongly recommended that a BMS initiated stir-up/circulation programme (with the air fans off) is introduced to ensure all areas of the cooling system are circulated and to minimise the risk of stagnation. A remote or automated monitoring system for essential analytics such as bromine and conductivity should also be introduced.

Adiabatic systems with water spray jets

You should consider isolating the water supply to adiabatic systems unused in premises that are temporarily vacant or void to prevent water stagnation in the supply pipework.

Planning for re-opening/re-occupation of buildings

Planning for the re-opening, re-occupation and re-commissioning of buildings and their associated water systems must consider the safety of the maintenance engineers or operatives carrying out monitoring and remedial works. It is foreseeable that water systems that have not been used as designed, or been subject to regular flushing, present a greater risk of colonisation of legionella and other water-borne micro-organisms than would be normally expected. Reasonably practicable measures such as limiting aerosol generation (plastic bags or funnels over outlets), minimising exposure (flushing and leaving the room or area) and use of suitable respiratory protection (RPE) must be considered.

For smaller properties, or those with simplistic hot and cold water systems, the minimum should be extended flushing of hot and cold water outlets. In larger and more complex buildings with cold water storage cisterns (tanks), showers, calorifiers and more complex pipework, the expectation is likely to be for more extensive flushing followed by cleaning and disinfection.

Occupants should be reassured that the water supply system is safe, and the re-commissioning process has been effective with water samples for potable water being taken from drinking water supplies and legionella samples from cold and hot water services in accordance with British Standards.

Water samples should be taken 3 to 7 days following re-commissioning. This will allow any biofilms or other micro-organisms in blind spots of supply, or problematic areas of supply that were not destroyed during the cleaning and disinfection or pasteurisation process, to be identified allowing further treatment prior to occupation. Water system blind spots, or problematic areas of the supply, may need repeat or additional treatments.

Action levels following legionella sampling in hot and cold water systems (Table 2.2 taken from HSG274 Part 2)

Legionella Bacteria (cfu/l)	Recommended Actions
>100 cfu/l and up to 1000	**Either** • If the minority of samples are positive, the system should be resampled. If similar results are found again, a review of the control measures and risk assessment should be carried out to identify any remedial actions necessary. **Or** • If the majority of samples are positive, the system may be colonised, albeit at a low level. An immediate review of the control measures and risk assessment should be carried out to identify any other remedial action required. Disinfection of the system should be considered.
>1000 cfu/l	The system should be re-sampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions, including possible disinfection of the system. Retesting should take place a few days after disinfection and at frequent intervals afterwards until a satisfactory level of control is achieved.

Bacterial results

Acceptable results for the mains cold water (drinking water outlet(s) or from a cold water storage cistern, bacterial levels should have no abnormal change and in any case the level should not exceed:

- Coliforms – 0 per 100 ml
- Enterococci – 0 per 100 ml
- E-*coli* – 0 per 100 ml
- TVC – 22 °C – 100 cfu/ml
- TVC – 37 °C – 10 cfu/ml