

# Control of Legionella Best Practices, Regulations, and Health Guidelines

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# Legionella Executive Summary

Legionella is a waterborne bacterium naturally found in freshwater environments such as lakes and streams. While typically harmless in the wild, it can become a serious public health hazard when allowed to proliferate in man-made water systems. Common sources of contamination include cooling towers, hot and cold water systems, spa pools, and other environments where water is stored or recirculated. The inhalation of aerosolized water droplets containing Legionella bacteria can lead to Legionnaires' disease—a severe, potentially fatal form of pneumonia that primarily affects older adults, those with weakened immune systems, and individuals with chronic respiratory conditions.

Outbreaks of Legionnaires' disease can have devastating consequences, both in terms of human health and legal liability. As a result, there has been increasing regulatory pressure and public awareness surrounding Legionella risk management. Employers, building owners, landlords, and service providers all have a legal duty of care under health and safety law to assess, manage, and mitigate the risks posed by Legionella in water systems.

This white paper serves as a comprehensive resource for Legionella control companies, mechanical and electrical (M&E) engineers, plumbing contractors, facilities managers, and duty holders. It provides an up-to-date review of relevant UK legislation—including the Approved Code of Practice (ACoP) L8, HSG274 technical guidance, and other statutory obligations. It also highlights industry best practices for water system design, maintenance, monitoring, and disinfection.

With advancements in technology and growing emphasis on proactive risk management, the ability to maintain safe and compliant water systems is more achievable—and more essential—than ever.

This white paper aims to equip professionals with the knowledge and practical guidance needed to:

- Identify and assess potential Legionella risks
- Understand and comply with current legal requirements
- Implement effective control measures and water hygiene strategies
- Protect occupants, staff, and the public from preventable illness
- Reduce the risk of non-compliance, reputational damage, and prosecution

Ultimately, controlling Legionella is not only a regulatory obligation—it's a fundamental part of ensuring building safety, protecting public health, and upholding professional standards in the built environment.

# Regulations

In the UK, the control of Legionella is governed primarily through the Health and Safety Executive (HSE) and supported by guidance from the Environmental Protection Agency (EPA), Public Health England (PHE), and other regulatory bodies. Compliance with these regulations is not optional—failure to do so can result in criminal prosecution, heavy fines, and severe reputational damage.

### Approved Code Of Practice (L8 ACOP L8)

Issued by the HSE, ACOP L8 outlines legal duties and best practices for controlling Legionella in water systems. Key requirements include:

- Risk assessments
- Appointment of a responsible person
- Written control scheme
- Regular maintenance
- Record keeping

Though not law, ACOP L8 is enforceable and may be cited in legal proceedings.

### HSG274 Technical Guidance (Parts 1-3)

HSG274 supplements ACOP L8 with detailed technical guidance:

- Part 1: Cooling Towers Design, commissioning, cleaning, and biocide dosing practices.
- Part 2: Hot and Cold Water Systems Practical guidance for managing temperature control, flushing, descaling, and outlet management.
- Part 3: Other Risk Systems Covers spa pools, humidifiers, vehicle washers, and more specialised equipment.

This guidance ensures that duty holders can take a risk-based, system-specific approach.

### Control of Substances Hazardous to Health (COSHH) Regulations 2002

Under COSHH, employers must control substances that pose health risks to employees, including biological agents like Legionella. This means:

- Identifying potential exposure routes.
- Preventing or adequately controlling exposure.
- Providing appropriate training and PPE where required.













### Notification and Reporting Duties under RIDDOR

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) requires employers to report any diagnosed cases of Legionnaires' disease that may be linked to their work activities.

### Water Supply (Water Fittings) Regulations 1999

These regulations govern the design and installation of plumbing systems to ensure they do not pose a risk of contamination. For Legionella control, this includes:

- Avoiding cross-connection between potable and non-potable water.
- Preventing backflow.
- Using WRAS-approved fittings and materials.

### Building Regulations - Approved Document G

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### The Management of Health and Safety at Work Regulations 1999

These regulations reinforce the requirement for a systematic risk assessment and the appointment of competent persons to manage risks, including Legionella.





### Health and Social Care Act 2008 (Regulated Activities Regulations 2014)

Applies specifically to healthcare providers such as hospitals and care homes. It requires service providers to maintain systems that protect patients from infection, including those caused by Legionella.





# **Best Practices**

## System Design and Installation

- Avoid dead legs and redundant pipework that encourage stagnation.
- Ensure pipework is designed to promote continual flow and even distribution.
- Install backflow prevention devices to avoid contamination of clean water.
- Select non-porous materials (such as WRAS-approved plastics or stainless steel) that discourage biofilm growth.
- Include provisions for regular flushing in low-use outlets.

### Temperature Control

Temperature is one of the most effective natural deterrents against Legionella.

- Hot water should be stored at 60°C or above.
- Hot water must reach all outlets at 50°C within one minute.
- Cold water should be stored and distributed below 20°C.
- Thermostatic mixing valves (TMVs) should be installed downstream of the supply to avoid reducing storage temperatures.
- Insulate pipework and storage tanks to minimise heat loss or gain and avoid thermal mixing zones.

## Water Treatment and Disinfection

- Chemical and physical treatments should be part of a comprehensive control scheme.
- Biocides: Chlorine dioxide and monochloramine are commonly used. These are effective against biofilms and scale.
- Ultraviolet (UV) Light: Destroys Legionella DNA but must be combined with other treatments as it does not offer residual protection.
- Copper-Silver Ionisation: Effective in healthcare and large-scale systems.
- Shock Dosing: Used after system disturbances, contamination, or commissioning. Requires careful risk management.
- Ensure all treatment equipment is maintained and calibrated according to manufacturer guidelines.

# Why GRP Tanks



### Why GRP Tanks Are Suitable for Legionella Prevention

Glass Reinforced Plastic (GRP) water storage tanks are an industry-preferred solution for maintaining safe and hygienic water systems—particularly in commercial, industrial, and healthcare settings where Legionella prevention is critical. Their material composition, modular design, insulation performance, and maintenance efficiency make them especially well suited to risk reduction strategies.

### Smooth, Hygienic Surfaces

GRP tanks feature a smooth gelcoat interior that resists biofilm and scale build-up, making cleaning easier and reducing Legionella risk.

### **Modular Construction**

Sectional panels allow tanks to be assembled on-site, fitting tight spaces while avoiding dead legs. Full internal access supports easier inspection and maintenance.

### **WRAS-Approved Materials**

Manufactured with certified, non-corrosive resins, Tricel tanks meet UK drinking water standards and are built for long-term durability.

### **Built-In Insulation**

Encapsulated polyurethane insulation (25– 50mm) helps maintain safe water temperatures, reducing risk zones for Legionella growth.

### Weather-Resistant Finish

UV-stable external coatings protect outdoor installations, maintaining hygiene and extending tank lifespan.

### Flexible, Compliant Design

Available in one-piece, two-piece, or sectional formats, Tricel tanks conform to BS EN 13280 and EN 12566 for full regulatory compliance.

### **Custom Accessories**

Optional add-ons like screened overflows, access hatches, and integrated sensors help prevent contamination and support remote monitoring.

### Maintenance-Ready

Features like access panels, ladders, and viewing windows streamline cleaning, chlorination, and inspection tasks.





# Technological Advancements in Legionella Control

Emerging technologies are revolutionaising how water systems are monitored, maintained, and managed for Legionella control. These advancements not only enhance compliance but also improve efficiency, reduce manual labour, and offer real-time insights into system performance

- Smart Temperature Monitoring
- Wireless, cloud-connected probes track water temperatures continuously, trigger alerts when levels enter the Legionella growth range, and log data automatically to support compliance audits.
- IoT Sensors
- Installed in pipework and tanks, IoT devices monitor flow, temperature, and usage patterns—flagging stagnation risks and feeding data into central dashboards for multisite oversight.
- Automated Flushing Systems
- These units flush outlets based on preset intervals or usage data, preventing stagnation without manual intervention.
- Advanced Biocide Dosing
- Modern dosing systems adjust chemical levels automatically, offer remote control, and send alerts for low supply or malfunctions—ensuring consistent disinfection.
- Digital Logbooks & Compliance Platforms
- Cloud-based tools replace paper logs, allowing instant access to test results, automated reminders, and integrated reporting for audits.
- AI-Powered Predictive Maintenance
- Al analyses system data to detect anomalies, predict risks, and recommend preventative maintenance before problems escalate.
- UV-C & Ultrasonic Treatments
- UV-C provides chemical-free disinfection, while ultrasonic tech disrupts biofilm in pipework and cooling systems.
- Digital Twin Technology
- Virtual replicas of water systems simulate performance and risk scenarios, aiding proactive planning and control.
- Integration with BMS
- Smart systems now link to Building Management Systems, enabling automated responses, optimised performance, and better hygiene control.

The adoption of digital and smart water management technologies is becoming a best practice for progressive organisations. When paired with a sound Legionella risk management framework, these innovations enable proactive control, rapid incident response, and confident regulatory compliance.



# Checklist

Legionalla Control Compliance Checklist

- Current Legionella risk assessment completed and documented
- Responsible person appointed and trained
- Hot and cold water temperatures monitored regularly
- Records kept for flushing, biocide dosing, and inspections
- Cleaning and disinfection schedules maintained
- Water tanks inspected and cleaned annually (minimum)
- Dead legs removed and unused outlets flushed
- Regular reviews of written control scheme and training records



# Maintenance Schedule

Task	Frequency	Responsible Person
Check and record outlet temperatures	Weekly	Site Maintenance
Flush seldom-used outlets	Weekly	Assigned Staff
Inspect cold water storage tanks	Monthly	Water Hygiene Contractor
Disinfect and clean storage tanks	Annually	Water Hygiene Contractor
Calibrate temperature sensors	Annually	Specialist Contractor
Review risk assessment	Annually or upon change	Responsible Person

# Frequently Asked Questions (FAQs)



### Q: Can Legionella grow in cold water?

A: Yes. Legionella can grow if cold water rises above 20°C, particularly in stagnant or poorly insulated systems. Proper insulation and regular usage help mitigate this risk.

#### Q: How often should water tanks be cleaned?

**A:** At least annually, or more frequently if contamination, sediment build-up, or system changes occur. Visual inspections should be carried out more regularly.

#### Q: Is a Legionella risk assessment the same as Legionella testing?

**A:** No. A risk assessment identifies the potential for Legionella growth, while testing determines whether the bacteria is currently present in the system.

#### Q: Do all buildings need to carry out Legionella testing?

**A:** Not necessarily. Routine testing is only required in certain settings such as healthcare, cooling towers, and high-risk environments. Other sites may rely on control measures without routine sampling, based on their risk profile.

#### Q: What is a written scheme of control?

**A:** It is a documented plan outlining how Legionella risks are managed on-site. It includes procedures for temperature monitoring, flushing, maintenance, and emergency response.

#### Q: Who is responsible for Legionella control in a building?

**A:** The duty holder (employer, landlord, or building manager) is responsible. They must appoint a competent person to manage daily control measures and ensure compliance.

#### Q: Can Legionella be completely eradicated from a system?

**A:** Total eradication is difficult. The goal is control—keeping conditions unfavourable for growth through temperature management, disinfection, and routine maintenance.

#### Q: How long does Legionella survive in water?

A: Legionella can survive for long periods in biofilms or sediment. Under favourable conditions, it can multiply rapidly, making continuous control essential.

#### Q: What should I do if Legionella is detected?

**A:** Follow your incident response plan. This typically involves isolating outlets, conducting shock disinfection, notifying stakeholders, retesting, and updating risk assessments.

### Q: Are there any building types that are exempt from Legionella regulations?

A: No. All premises with water systems are subject to the Health and Safety at Work Act 1974 and associated regulations. The extent of control depends on the specific risk level.

#### Q: Can showerheads and taps contribute to Legionella exposure?

**A:** Yes. Any outlet that creates aerosolised water can transmit Legionella if bacteria are present. Regular cleaning and descaling are essential.



# **Case Studies**

### CASE STUDY1

**NHS Hospital Water Safety Upgrade** | A major NHS hospital in the North of England experienced sporadic low-level Legionella detections in multiple wards. The Trust implemented a full water safety review, updated their risk assessment, and upgraded calorifiers. Key interventions included installing continuous temperature monitoring systems, increasing flushing routines for low-use outlets, and switching to a chlorine dioxide dosing system. Within three months, Legionella counts dropped to undetectable levels. The facility now conducts quarterly independent audits and maintains 100% compliance with HTM 04-01.

### CASE STUDY 2

**Educational Campus Remediation** | A university campus reported non-compliant temperatures in cold-water outlets and a buildup of biofilm in storage tanks. Working with a Legionella control contractor, the maintenance team upgraded cold-water storage tanks to insulated GRP units, rebalanced the pipework system, and implemented automatic flushing devices in low-use accommodation blocks. The proactive maintenance programme reduced reactive callouts by 70% over the following academic year and eliminated all instances of bacterial growth.

### CASE STUDY 3

**Hotel and Spa Complex Reopening Post-COVID** | Following extended closure due to the pandemic, a high-end hotel experienced Legionella growth in its spa and guest water systems. Before reopening, the management team conducted a full system chlorination, replaced filters, recommissioned all water heaters, and introduced an electronic logbook with automated temperature sensors. Staff received updated training, and independent testing confirmed the system was safe. No further issues were reported.

### **CASE STUDY 4**

**Housing Association Legionella Prevention Programme** | A housing association managing over 300 properties introduced a structured Legionella prevention programme after several properties failed compliance inspections. Key actions included replacing outdated water tanks with pre-insulated GRP units from Tricel, implementing monthly flushing for void properties, and running training workshops for property managers. The association reduced non-compliance rates from 28% to under 5% within one year.



# Legal Consequence

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## Barrow-in-Furness (2002)

- Incident: An outbreak of Legionnaires' disease at the Forum 28 arts centre led to 7 deaths and over 170 people falling ill.
- **Cause:** A poorly maintained air conditioning unit and a failure to act on prior risk assessments.
- **Outcome:** Barrow Borough Council was fined £125,000. The council engineer responsible was charged with manslaughter (later acquitted) and fined £15,000 for breaches under health and safety law.
- **Key Lesson:** This remains the UK's worst Legionella outbreak and underscores the legal and reputational risks of inadequate system maintenance and failure to act on risk assessments.

## Basildon Hospital (2010)

- Incident: A premature baby died from Legionnaires' disease.
- Cause: Contaminated water supply in the neonatal unit.
- **Outcome:** The Care Quality Commission heavily criticised the hospital for inadequate risk controls and poor compliance with HTM 04-01.
- **Key Lesson:** Healthcare settings are especially high-risk and require rigorous monitoring and control protocols.

## Feathers Hotel, Ludlow (2017)

- Incident: A guest died after contracting Legionnaires' disease following a stay at the hotel.
- **Cause:** Contaminated water system due to inadequate temperature control and poor flushing routines.
- **Outcome:** The hotel was shut down temporarily, and investigations were conducted by public health authorities.
- **Key Lesson:** Small businesses are equally liable under health and safety laws and must maintain routine checks and controls.



# Conclusion

Controlling Legionella requires a proactive, systematic approach built on robust design, effective monitoring, and compliance with statutory regulations. Mechanical and electrical engineers, plumbing contractors, and water treatment companies play a central role in maintaining safe systems.

With updated regulations, improved technologies, and evidence-based guidelines from authorities like the EPA and HSE, there is no excuse for complacency. Staying informed, training staff, and routinely assessing risks are essential steps to ensuring public safety. Industry professionals are encouraged to invest in continuous education, adopt digital monitoring tools, and collaborate with specialists to future-proof their water systems against the threat of Legionella.

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