Keraflo
OUR WORLD IS WATER

Essential Guide to Water Tank Management

2026 Edition

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Contents

1.0 Who Should Read This Guide

This guide provides an up-to-date overview of professional best practice for the management, maintenance, and compliance of cold-water storage tanks in commercial, industrial, and institutional buildings.

It is designed to support:

- **Facilities and Estates Managers**
- **Building Services Engineers**
- **Consultants and Designers**
- **Building Owners and Landlords**
- **Technical Contractors**
- **Health & Safety Professionals**

The guide applies to all water storage tanks regardless of:

- **Location** - internal, external, above or below ground
- **Materials** - steel, GRP, composite, concrete
- **Design or configuration** - one-piece, sectional, single or twin chamber
- **Role or function** - sprinkler tanks, rainwater storage, greywater storage, salt water, softened water, process tanks, potable water

All must be managed in accordance with modern UK regulations and standards.

2.0 Understanding the Principles of Safe Water Storage

Modern best-practice for storing cold water in tanks focuses on two critical areas to keep supplies safe for building occupants and to manage costs: **Temperature Control** and **Preventing Leaks & Structural Compromise**.

2.1 Temperature Control

Maintaining appropriate temperatures is essential for preventing bacterial growth and ensuring system efficiency.

- Stored water must remain **below 20°C** to prevent stratification and bacterial proliferation, including Legionella.
- The temperature at the top and bottom of the tank should be identical to avoid stratification (warm water at the top with cooler water at the bottom). Regular turnover of the water helps to prevent this from happening.
- Tanks must be fitted with thermal insulation to minimise freezing or overheating, as required under the **Water Supply (Water Fittings) Regulations 1999** and supported by industry best practice. It is advisable that any extremes of hot and cold should be avoided, particularly within tanks situated outside and exposed to the elements.

Many modern sectional tanks are manufactured with what is known as a '**sandwich**' construction, which incorporates foam insulation approximately 25 mm thick; however, this does not apply to older tanks, and even where insulation is integral to the design, it may not be enough to meet the needs of particular sites.

At the opposite end of the spectrum, water that is too warm can be lethal. Water stored in a tank for any period of time can increase in temperature, making it a breeding ground for bacteria, which can cause deadly diseases such as Legionella and Pseudomonas.

In 2023, 604 cases of **Legionellosis** were reported in England and Wales, followed by 472 cases in 2024, with a case fatality rate of around 2.8%, demonstrating that Legionnaires' disease remains a persistent risk in poorly managed water systems (source: UKHSA, successor to Public Health England).

Buildings with **high periodic occupancy** have the greatest potential to allow water to be contaminated, particularly where water is stored at high ambient temperatures in the summer months. Examples include hospitals, sports stadia, and university halls of residence. It is in these situations that controlling the temperature and matching supply to user demand can be very challenging.

A temperature monitoring device is one option, incorporating alarms that are activated if the tank starts warming up or cooling down. This could switch on immersion heaters or water coolers – depending on the problem – and devices to dump the water if it has become too hot or too cold.

2.2 Preventing Leaks & Structural Compromise

Water is expensive, but unfortunately, leaks and water wastage are commonplace. Leaks can compromise water quality, waste resources, and damage building fabric.

One leaking tap wastes about

10 litres/day

=

3,650 litres/year

One leaking urinal wastes about

600 litres/day

=

219,000 litres/year

(Source: Water UK).

For good practice, you should:

- Inspect cold water storage tanks on a regular basis for signs of corrosion, panel bulging, sealant failure, damp areas under the tank, or dripping valves.
- During routine inspections, you should check the structural integrity of both sectional and one-piece tanks.

How to monitor your tank's temperature accurately

Tanktronic is an electronic tank management system that provides a complete solution to monitoring water levels and temperature. The system also manages and controls tank filling.

Tanktronic has been installed in many prominent buildings such as The O2 Arena in London. One Tanktronic unit can control either one or two single water tanks or a twin tank system.

Tanktronic's sensors react automatically to changes in water temperature, alerting users with a two-stage alarm. The primary alarm is an initial warning but the secondary alarm is both a warning and launch of an override action.

3.0 Tank Integrity

Maintaining tank integrity is essential for ensuring the long-term performance, safety, and reliability of any cold-water storage system. A tank's structural soundness directly influences water quality, system efficiency, and compliance with UK best-practice standards.

3.1 Supporting Base

Water storage tanks require a firm, level, supported base that is unyielding.

Even if this requirement matches the original specification, over time the supporting base may shift; this is more likely in below-ground tanks, which can suffer from hydraulic lift if they are not anchored properly or poorly installed.

Storage tanks are generally not designed to take heavy additional loading, for example, from cars or trucks driving over them or parking above them. If a tank is going to be under a road, drive, or parking area, you will either need to divert the traffic around it or use engineered concrete reinforcements around the tank to support the vehicles and prevent the tank's collapse.

Poor support is a common cause of tank distortion and loss of structural performance.

3.2 Tank Condition

Visual inspection, inside and out, to determine whether the tank is sound, is usually sufficient; a tank will need to be drained down to be inspected internally.

Key areas to inspect include:

- Tank walls for signs of bulging or undue distortion
- Any leaks from the equilibrium valve when in the fully closed position
- If the equilibrium valve is placing stress on the tank wall fixing point
- The interior surface is clean, with no scale or microbiological growth, and the bottom of the tank is free from debris or silt
- Notices and Health & Safety warning labels are clearly visible
- For sectional tanks, the panel bolts are tight
- External surfaces for corrosion or UV degradation (especially GRP tanks)
- The lid, hatch, or cover is secure or, if needed, securely locked
- Insulation and lid condition

3.3 Maintenance Log

The guide should include or link to a **maintainable log template** recording:

- Inspection dates
- Clean/flush events
- Corrective actions
- Water temperature data

4.0 Managing Water Levels

Effective water-level management is essential to maintaining reliable building services, protecting system components, and ensuring water hygiene. A well-designed cold-water storage system must balance supply, turnover, and operational resilience, particularly in buildings where demand fluctuates significantly throughout the day or season.

4.1 Ensuring a Constant Supply of Water

A water storage tank is designed to provide an uninterrupted supply of water for the building's occupants and operations.

Tank capacity needs to be calculated to match the usage demands of the building. This is particularly important for buildings that have fluctuations in occupancy, e.g. schools, hotels, or sports stadia, and that experience a considerable variation between peak and low demand.

Varying tank capacity to meet demand

Keraflo's electronic tank management system, Tanktronic, features a calendar (holiday) setting enabling users to vary tank capacity to match demand, a particularly beneficial feature where stagnating water can breed legionella and other deadly bacteria

Routine or emergency maintenance can put a tank out of action. For this reason, choosing to install multiple tanks may be better than just a single tank. For cleaning or repairs, each tank in turn can be drained down, cleaned, rinsed, and refilled, ensuring that water supplies are maintained and the building can continue to function as normal.

4.2 Preventing Air Entering the System

Regular checks need to be carried out to check for low water levels. The water should not be allowed to fall below the top of the outlet pipe in order to prevent air from entering the pipework downstream of the water tank.

Air in the system can lead to:

- Noise – humming, whistling and/or banging
- Corrosion – due to oxygen in the air
- Damage – pump sets can be damaged by cavitation (bubbles of air in water)
- Loss of water pressure leading to a restricted supply for some areas of the building

Properly set inlet levels and correctly fitted vortex inhibitors can prevent draw-down issues.

5.0 Maintaining the Correct Air Gap

Air gaps are essential to preventing contamination of potable water systems. In fact, there is a legal requirement for an appropriate anti-siphon air gap between the inlet supply and the tank's critical water level.

Click on the image to download and view Keraflo's Guide to the UK Water Supply Regulations

- Type **AB Air Gaps** are required where backflow risk is high.
- Designers should confirm compliance with the **Water Supply (Water Fittings) Regulations 1999**.
- Checking the air gap should be included in the annual inspection of the tank.

6.0 Maintaining Effective Valve Operation

The effective operation of the tank's valves can be compromised over time by limescale deposits and in twin-chamber tanks, an imbalance in tank filling/emptying.

6.1 Preventing Limescale Impairment

Hard water areas risk Limescale build-up on float valves, compromising performance.

- Regular visual inspections and descaling will prevent sticking valves and inefficient inflow.
- Checks should also be carried out to ensure the float valve can reach both the fully closed position and the fully open position. The on/off flow delivery should be completed without dribble or valve bounce.

Keraflo Aylesbury™ float valves are generally unaffected by scale build up. Our unique valve design also eliminates water hammer, valve bounce and pump hunting while the Aylesbury valve's positive on/off operation improves water turnover.

6.2 Twin-Chamber Tank Imbalance

Water tanks with an internal division, also known as balanced tanks, twin tanks, or split tanks, can suffer from usage imbalance where water from one side of the tank is repeatedly drawn upon, leaving the other chamber underused or not used at all.

Overworking the inlet valve on the active tank means the valve for the other chamber becomes increasingly inactive and stops providing effective water turnover. The result is that the stored water can stagnate and stratification can occur (a biofilm forms on the surface, and temperature varies across the water depth).

Ideally, both valves and chambers should be operating equally and in unison to meet demand. If not, it may be that the tank is undersized or that the valves need adjustment to correct the level of stored water to meet the (reduced) level of demand.

7.0 Cleaning Your Tanks

Water storage tanks should be cleaned and chlorinated on a regular basis. Cleaning frequency depends on tank condition and risk assessment, but should generally be carried out **annually** or **as required** by inspection results.

A typical cleaning routine may be:

1. Isolate the tank outlet and fill the tank
2. Put a cleaning agent (usually chlorine) into the tank
3. Leave to allow the cleaning process to take place (this period can vary depending on the volume of water/size of tank)
4. Lock off the inlet and drain the tank down through the outlet(s)
5. Isolate the tank
6. Scrub the tank's internal walls if required and remove any debris
7. Refill the tank to 'rinse'
8. Drain the tank
9. Re-connect the tank's inlet and outlet(s) to the pipework and refill with water
10. Check water quality and resume normal operation
11. Log maintenance details

If present, the screened meshes across the warning and overflow pipe fittings should be checked to ensure these are secure, clean, and unobstructed by debris.

Please note that cleaning should only be carried out by competent professionals.

8.0 Compliance Overview

Achieving and maintaining compliance is fundamental to ensuring the safety, performance, and legal integrity of any cold-water storage installation. UK water systems are governed by a robust framework of regulations and standards that set out clear requirements for design, installation, operation, and maintenance. Adhering to these standards not only protects water quality and reduces health risks, such as those associated with Legionella, but also ensures that tanks are built, tested, and maintained to recognised levels of durability and efficiency.

A compliant tank installation should satisfy:

- **Water Supply (Water Fittings) Regulations 1999** (all UK regions)
- **HSG 274 Part 2** (Legionella control)
- **BS 8558** (general water supply design & commissioning)
- **BS EN 13280** for GRP sectional tanks
- **WRAS approval**, **KIWA certification**, & **NSF Regulation 4** compliance for materials and components

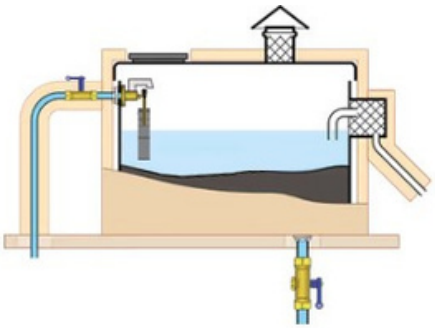
It is worth noting that ATCM member manufacturers are required to meet strict design, performance, and testing standards, providing assurance of high-quality products.

9.0 Preventing Stagnation & Promoting Circulation

Preventing stagnation is one of the most critical aspects of maintaining a safe and hygienic cold-water storage system. Stagnant water not only encourages the growth of harmful microorganisms, including Legionella, but can also lead to deteriorating water quality, unpleasant odours, and reduced system efficiency. Ensuring good circulation and regular turnover is therefore essential for maintaining compliance and safeguarding building users.

To promote healthy water movement and minimise the risk of stagnation, consider the following best-practice measures:

- **Ensure outlets are correctly positioned** so water flows uniformly through the tank and avoids areas where water may sit unused.
- **Avoid oversizing tanks**, as excessively large capacities can reduce turnover and increase the time water remains stored, particularly in buildings with fluctuating demand.
- **Inspect regularly for dead legs and low-turnover sections**, which are common sources of stagnant water and may require redesign or isolation.
- **Use twin-chamber tanks effectively** to maintain consistent flow patterns and enable planned maintenance without compromising turnover or supply.



Here is a flow diagram to show best-practice circulation patterns, showing how water should enter, move through, and exit the tank to ensure continuous turnover and optimal system performance.

10.0 Choosing, Repairing, or Replacing a Tank

Selecting the right water storage tank or deciding whether an existing tank should be refurbished or replaced, is a critical part of maintaining a safe, compliant, and efficient water system. The correct choice depends on several factors including building demand, available space, access constraints, compliance requirements, and the structural condition of the existing installation. It is importance of ensuring that all tanks meet recognised UK standards, are constructed using approved materials, and are maintained in accordance with manufacturer instructions, to ensure long-term reliability and performance. By understanding the different types of tanks available, knowing when repairs are appropriate, and selecting suppliers who meet strict quality criteria, building managers can make informed decisions that protect both water quality and system integrity.

10.1 Common Tank Types

- **One-piece tanks** – Pre-formed units supplied as a single structure. They offer simple installation and are ideal for smaller plants or locations with straightforward access.
- **Sectional GRP tanks** – Modular panels assembled on site, perfect for areas where access is restricted. These must comply with **BS EN 13280:2001**, and the complete assembly, including fittings, must be **WRAS approval**, **KIWA certification**, and **NSF Regulation 4** compliance for materials and components, as required for GRP tanks used for potable water.

10.2 Repair vs Replace

We have outlined some guidance criteria to help building operators determine the best course of action:

- **Repair (Refurbish)** – Tanks that remain structurally sound but show signs of deterioration can often be refurbished. A common refurbishment method is installing a butyl lining, which restores internal surfaces and extends tank life without requiring full replacement.

- **Replace** – Tanks that exhibit heavy corrosion, significant distortion, compromised structure, or widespread failure of joints and panels should be fully replaced to ensure safety, hygiene, and compliance with current standards.

10.3 Selecting a Supplier

Choosing a supplier with the correct credentials is essential.

The **Association of Tank and Cistern Manufacturers (ATCM)** requires its members to meet strict criteria, including compliance with the **UK Water Supply (Water Fittings) Regulations 1999,** adherence to British and European tank standards, and third-party accreditation such as **WRAS approval**, **KIWA certification**, and **NSF Regulation 4** and **UKAS-approved testing**. ATCM membership provides assurance that tanks are designed, manufactured, and tested to consistently high standards of performance and quality.

11.0 Troubleshooting Guide (Common Issues)

Even a well-maintained water storage system can occasionally experience issues that affect performance, water quality, or system reliability. Identifying early warning signs and understanding their root causes enables building operators to resolve problems quickly and prevent minor faults from escalating into costly failures. This troubleshooting guide highlights the most common operational issues encountered in cold-water storage tanks, outlines the likely causes, and provides practical, actionable steps to restore normal function and protect the integrity of the system.

Issue	Likely Cause	Recommended Action
Warm stored water	Poor insulation: solar gain	Inspect insulation: improve turnover
Overflowing tank	Faulty valve	Service or replace float valve
Dirty water	Poor circulation: debris	Clean and disinfect tank
Noisy pipework	Air ingress	Inspect air gap, vortex inhibitors, water level
Imbalanced twin chambers	Incorrect valve set-up	Consider changing independent valves for Keraflo's Tanktronic or Twin KP Float Valve Kit

By addressing issues promptly and investigating their underlying causes, building managers can significantly extend the lifespan of their tanks, maintain compliance, and safeguard water quality. Regular inspections, routine maintenance, and accurate record-keeping will greatly reduce the frequency and severity of these common problems. For persistent issues or complex faults, seeking support from an accredited supplier or qualified technician ensures repairs are completed in line with industry standards and best-practice guidance.

12.0 About Keraflo

Keraflo is a leading manufacturer of high-performance delayed-action float valves and advanced electronic tank management systems, designed to deliver precise, reliable, and efficient water control in commercial, industrial, and institutional buildings.

With decades of engineering expertise, Keraflo products are built to support safe water storage, optimise system turnover, and reduce the operational risks associated with poorly controlled tank levels. Keraflo's solutions are developed to align fully with UK water regulations and best-practice standards, ensuring building owners and facility managers can maintain compliance while achieving long-term performance and sustainability goals.

Keraflo's portfolio includes robust mechanical valves renowned for their longevity and accuracy, as well as intelligent digital solutions such as Tanktronic, which enables users to monitor water levels, manage capacity, and optimise turnover with advanced scheduling and control features. Whether ensuring stable supply in high-demand buildings or helping reduce stagnation risks in facilities with fluctuating occupancy, Keraflo products provide dependable, future-focused water management.

To learn more about how Keraflo products can improve the performance and compliance of your water storage systems or to speak with our technical team about selecting the right solution, visit our website or get in touch with us directly.

Our experts are ready to support you in designing, managing, and maintaining safe, efficient, and fully compliant water storage installations.

Tel: 0118 921 9920 **Email:** info@keraflo.co.uk

13.0 Keraflo Product Range

Keraflo offers a comprehensive range of engineered solutions designed to optimise the performance, efficiency and reliability of cold water storage systems. From industry-leading mechanical float valves to intelligent electronic tank management and LPCB-approved sprinkler tank valves, every Keraflo product is built on decades of engineering expertise and proven ceramic valve technology. Designed and manufactured in the UK, our products support safe, efficient water management across commercial and industrial environments.

Mechanical Valves

The Aylesbury™ Range

Keraflo's Aylesbury™ mechanical float valves are synonymous with excellence. With tens of thousands in continuous operation, they are the benchmark for durability and performance in cold water storage tanks.

Designed with a **delayed action principle**, Keraflo valves:

- Maximises the capacity of tanks
- Eliminate constant trickle
- Reduce water wastage
- Improves water turnover
- Prevent noise
- Minimise wear and maintenance
- Improve hygiene by reducing stagnation

Product Options:

- **Aylesbury K Type Float Valve**
- **Aylesbury KAX Type Float Valve**
- **Aylesbury KB Type Float Valve**
- **Aylesbury KP Type Float Valve Kit**

Suitable for domestic, commercial and industrial applications, the Aylesbury™ range offers long service life and consistent, reliable performance — even in demanding environments.

Tank Management

Tanktronic – Intelligent Monitoring & Control

Tanktronic is Keraflo's advanced electronic tank management system, providing real-time monitoring and control of cold water storage tanks.

Designed to support compliance, safety and efficiency, Tanktronic enables:

- Continuous water level monitoring
- Temperature monitoring
- Improves water turnover
- Alarm notification for faults or abnormal conditions
- Calendar functions for matching capacity to demand
- Improves maintenance planning
- Enhances compliance with water hygiene regulations

By digitising tank management, facilities managers gain visibility, control and peace of mind — reducing risk while improving operational efficiency.

Sprinkler Tank Valves

LPCB Approved. Safety Assured.

Keraflo's Fire Sprinkler Tank Valves are the first products available on the market to comply with LPCB Loss Prevention Standard LPS 2083, part of LPS® 1276.

A sprinkler tank float valve plays a critical role. It ensures the fire sprinkler tank remains full, ready and operational, without overflow, water waste or unnecessary maintenance.

Product Options:

- **FB Type Fire Sprinkler Tank Valve**
- **FP 1276 High Flow Type Fire Sprinkler Tank Float Valve Kit**

Engineered for reliability and high flow performance, Keraflo sprinkler valves provide dependable operation when it matters most.

Why Choose Keraflo?

In demanding commercial environments, water control systems must perform flawlessly. Keraflo designs and manufactures precision-engineered solutions that deliver measurable improvements in efficiency, hygiene and operational reliability. With proven ceramic valve technology and LPCB-approved sprinkler systems, Keraflo sets the benchmark for quality and performance in cold water storage management.

- Over 40 years of engineering expertise
- UK design and manufacture
- Industry-leading ceramic valve technology
- Reduced water waste and operational costs
- Improved hygiene and compliance
- LPCB approved sprinkler solutions
- Trusted in thousands of installations worldwide

Keraflo products are designed not just to meet standards but to exceed expectations.

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