

Water Storage for Fire Suppression

Designing Resilient Systems with LPCB-Certified Sprinkler Tanks



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Fire Suppression



Executive Summary

Reliable water storage is the foundation of any effective fire suppression system. In high-risk environments such as commercial buildings, logistics centres, hospitals, schools, and critical infrastructure, the need for a dependable, regulation-compliant water source is non-negotiable. Fire sprinkler systems rely on immediate and sustained access to water during emergencies, and in cases where mains pressure is insufficient or inconsistent, dedicated storage tanks are essential.

This whitepaper presents a comprehensive overview of Tricel's LPCB-certified fire suppression tanks, examining their role in achieving safety, regulatory compliance, and operational resilience. It explains why Loss Prevention Certification Board (LPCB) approval is widely recognised as a benchmark of quality and performance across the fire protection industry. The document outlines the full certification process—including type testing, factory production control, and ongoing surveillance—and demonstrates why LPCB certification is increasingly required by insurers, fire authorities, and regulatory bodies.

Tricel's modular Glass Reinforced Plastic (GRP) tanks are designed for maximum durability and flexibility, with a lifespan exceeding 25 years. The tanks are available in a range of sizes and configurations to meet the needs of both new builds and retrofit projects. For confined spaces or internal installations, Totally Internally Flanged (TIF) options provide an ideal solution.

In addition to tank supply, Tricel offers compatible fire pump systems engineered to BS EN 12845 and BS 9251 standards. These include end-suction, multistage booster, and diesel/electric sets, all supported by expert design services, installation, and ongoing technical assistance.

Real-world case studies included in this paper showcase successful installations across the UK and Ireland—from distribution centres and healthcare facilities to educational buildings—highlighting the adaptability of Tricel's fire suppression solutions. These projects also reflect how the company's tanks and pump systems are consistently chosen to meet high-specification insurance and safety requirements.

Finally, the whitepaper looks at future developments in fire protection, including IoT-based monitoring systems, Al-driven diagnostics, and cloud-based compliance tools. Tricel's ongoing investment in innovation ensures that its products not only meet today's fire safety challenges but are also prepared for tomorrow's demands.

Whether for public or private sector projects, Tricel's LPCB-certified sprinkler tanks represent a trusted, scalable, and future-ready solution in modern fire suppression planning.



Regulatory Framework

In the UK, fire suppression systems—particularly sprinkler systems and associated water storage—are governed by a combination of legal requirements, national standards, and industry-recognised best practices. Below is a summary of the key regulations and standards relevant to fire suppression in the UK:

The Regulatory Reform (Fire Safety) Order 2005 (RRFSO)

- · Applies to all non-domestic premises in England and Wales.
- Places a legal duty on the 'Responsible Person' (e.g. employer, building owner) to carry out a fire risk assessment and implement appropriate fire precautions.
- Sprinkler systems and suppression measures must be suitable and sufficient for the risk identified.
- Compliance is enforced by local Fire and Rescue Services.

Building Regulations – Approved Document B (Fire Safety)

- Sets out statutory fire safety requirements for new buildings, extensions, and material alterations.
- Part B1-B5 covers means of warning, escape, internal fire spread, and access for firefighting.
- Sprinkler systems are required in:
- Residential buildings over 11 metres (England) and all new flats (Wales)
- Warehouses over 20,000m² (England)
- Schools (recommended)
- Water supplies for fire suppression systems must be reliable, often necessitating dedicated storage tanks and compliant pump systems.

British Standards & Codes of Practice

BS EN 12845: Fixed firefighting systems – Automatic sprinkler systems

- The primary design standard for commercial and industrial sprinkler systems in the UK.
- · Covers:
- System design and installation
- Risk categories (LH, OH, HH)
- Water supply requirements
- · Testing, commissioning, and maintenance
- LPCB-certified tanks must meet BS EN 12845 requirements, especially around minimum flow rates and water storage duration (typically 30–60 minutes depending on hazard category).





Regulatory Framework





British Standards & Codes of Practice

BS 9251: Sprinkler systems for residential and domestic occupancies

- Applies to residential buildings (e.g. care homes, flats, HMOs)
- Recognises reduced pressure and flow requirements compared to commercial systems
- Tank sizing and pump configuration can vary significantly under this standard

BS 9990: Non-automatic fire-fighting systems in buildings

- Refers to water supplies for firefighting equipment like fire hydrants and hose reels.
- May overlap with fire suppression water storage in some larger developments.

LPCB Certification (LPS 1276)

- Not a legal requirement but often mandated by insurers or specified in procurement for high-risk buildings.
- LPS 1276 sets out approval criteria for water storage tanks used in fire sprinkler systems.

Requires:

- Structural and leakage tests
- Factory Production Control (FPC)
- Surveillance audits
- Products appear in the Red Book Live database, often referenced in tenders and fire strategy documents.

LPCB BO

Insurance and Industry Guidance



- Insurers may require compliance with LPCB and BS EN 12845 for buildings deemed high risk.
- FM Global and other international insurers may specify their own standards (e.g. FM 4020 for tanks).
- The Fire Protection Association (FPA) offers best-practice guidance often aligned with LPCB and British Standards.



Best Practices

Conduct a Comprehensive Fire Risk Assessment

- Identify hazards: flammable materials, ignition sources, and structural vulnerabilities.
- Determine appropriate suppression method: sprinkler, misting, foam, inert gas, or hybrid systems.
- Base your design and system choice on occupancy type, building use, and fire load

Design Systems to Recognised Standards

Follow the correct design standard:

- BS EN 12845 for commercial/industrial sprinkler systems.
- BS 9251 for domestic and residential properties.
- Ensure risk category (LH, OH, HH) is correctly assigned.
- For critical infrastructure, consider dual water supply, redundant pumps, or fire zones.

Use LPCB-Certified Components

Tanks, pumps, valves, and control panels should be LPCB-certified (e.g. LPS 1276 for tanks).

Certification ensures:

- Performance under fire conditions
- Resistance to corrosion and failure
- Approval by insurers and regulators

Ensure Adequate Water Supply

- Volume and pressure must meet the system's flow rate for the required duration (often 30–60 minutes).
- Use dedicated water storage tanks if the mains cannot meet demand.
- Incorporate jockey pumps and automatic fill systems to maintain water levels.

Select the Right Pump Configuration

- Use duplex pump sets (main + standby) for critical facilities.
- Choose from diesel, electric, or hybrid drive options based on site needs.
- Test pumps under load as part of system commissioning.



Best Practices



Fire suppression systems should connect with:

- Fire alarm control panels
- BMS (Building Management Systems)
- Emergency lighting and evacuation controls

Plan for Installation and Accessibility

Ensure:

- Adequate space for access, inspection, and maintenance
- External indicators for water level and pump status
- Ground conditions and base design
- Proximity to fire risk zones
- Integration with pumps, control valves, and alarm systems
- Accessibility in emergency situations

Commission and Test Thoroughly

Perform full functional testing:

- Hydraulic tests (tank and pipework)
- Flow and pressure testing
- Pump automatic start/stop and fault alarms

Record results and issue commissioning certification.

Implement Regular Maintenance

Follow BS EN 12845 Annex K for maintenance intervals:

- Weekly: Pump house inspection and test
- Monthly: Valve checks, alarms

Train and Educate Staff

Site teams should understand:

- How the suppression system functions
- How to respond to faults or activations
- When to escalate to fire services or service providers



What is LPCB

LPCB stands for the **Loss Prevention Certification Board**. It is a globally recognised, independent certification body for fire and security products and systems. LPCB is operated by BRE Global, part of the Building Research Establishment (BRE) in the UK. LPCB provides third-party approval for products and services that meet specific fire and security performance standards. Certification ensures that products—like fire suppression tanks, sprinklers, alarms, and extinguishers—are tested, verified, and consistently manufactured to a high standard.

Why LPCB Certification Matters

- Recognised by insurers: Many insurers will only cover buildings using LPCB-certified fire protection systems.
- Accepted by regulators: Certification supports compliance with UK Building Regulations and the Fire Safety Order.
- Used in procurement: Often specified by architects, fire engineers, and contractors.
- Listed on RedBookLive.com, a searchable online register of approved fire safety products

How LPCB Certification Works

Initial Type Testing

• Products undergo physical tests to assess performance under simulated fire or environmental conditions.

Factory Production Control (FPC)

• The manufacturing facility is audited to ensure quality systems, repeatability, and traceability.

Ongoing Surveillance

• LPCB carries out regular audits and product retests to confirm continued compliance.

Red Book Listing

• Certified products are listed in the LPCB Red Book Live, an online database used by insurers and specifiers.

Tricel's LPCB approved Fire Suppression Tanks

Tricel's LPCB approved fire suppression tanks ensures that our sprinkler tanks meet international safety and performance standards which provides building owners, insurers, and regulators confidence in the fire protection strategy.

Product Features

- Modular GRP (Glass Reinforced Plastic) construction
- Wide range of capacities from 5,000 to 1,300,000 litres
- Optional internal liners and insulation
- Easy-to-maintain external flanges and access hatches

Manufacturing Highlights

- Factory-controlled ISO 9001 production environment
- Third-party LPCB surveillance and testing
- Local delivery and expert installation service across the UK and Ireland

LPS 1276: Issue 2.0 Cert/LPCB ref: 135c/01

CERT



What is WRAS

WRAS approval stands for Water Regulations Approval Scheme approval. It confirms that a product or material—such as a water tank, valve, fitting, or coating—complies with UK water supply regulations and is safe for use with potable (drinking) water. While WRAS is not mandatory for sprinkler tanks (since the water is not typically used for human consumption), dual-use tanks (e.g. for drinking and suppression) or combined building services systems may require it.

WRAS approval certifies that:

- Materials do not contaminate water (e.g. no leaching of harmful chemicals)
- Products prevent waste, misuse, undue consumption or contamination
- The product is mechanically sound and water-efficient
- It complies with the Water Supply (Water Fittings) Regulations 1999 in England & Wales (and equivalent in Scotland and Northern Ireland)

Why It Matters

- Required for public and commercial water systems connected to the mains
- Assures building control inspectors and water authorities the product is compliant
- Often mandatory for installations in hospitals, schools, hotels, and public buildings
- Helps avoid delays or rework due to non-compliant fittings

Standards & Certification Comparison: LPCB, WRAS, BS EN 12845, and LPS 1276

Standard / Certification	Governing Body	Purpose	Applies To	Tricel Compliance
LPCB (LPS 1276)	BRE Global / LPCB	Certifies construction and performance of fire sprinkler tanks	Fire suppression tanks (design, testing, factory QC)	Fully certified (all GRP models)
BS EN 12845	BSI	Code of practice for automatic sprinkler systems	Sprinkler system design and maintenance	Compliant in all fire tank setups
WRAS Approval	WRAS=UK water authorities	Confirms safety of products used with mains-fed drinking water	Drinking water tanks, combined service tanks	Applicable if dual-use with potable water
BS 9251	BSI	Sprinkler systems for domestic and residential occupancies	Low-rise and multi-occupancy buildings	Applicable to smaller pump sets or systems



TIF versus Externally Flanged Sprinker Tanks

Tricel offers both Totally Internally Flanged (TIF) and externally flanged sprinkler tank configurations to suit different site constraints and installation preferences. The following comparison highlights the key differences, benefits, and ideal use cases for each type.

Feature	TIF (Totally Internally Flanged)	Externally Flanged
Flange Positioning	All fixings located inside the tank	Flanges and fixings positioned externally
Installation Footprint	Compact, ideal for tight spaces	Requires more clearance around perimeter
Access Requirements	Can be installed in internal plant rooms	Easier external panel access if space allows
Aesthetic Considerations	Neater external profile	Slightly more industrial appearance
Maintenance Access	Internal access required for repairs	External flanges easier to service in open areas
Installation Time	Slightly longer due to confined assembly	Faster if ample working room is available
Best Use Case	Basement rooms, confined spaces, retrofits	Open service yards, rooftops, outdoor areas
Structural Strength	Equal to external when installed correctly	Equal to TIF when sealed and maintained

Both TIF and externally flanged tanks meet LPCB certification requirements and deliver reliable fire suppression performance. The choice depends largely on available space, access for installation and maintenance, and aesthetic or practical considerations.



Performance Metrics & Specifications

Tricel's fire protection water storage tanks are engineered for high performance, compliance, and adaptability across a wide range of commercial and industrial applications. Below is a summary of key technical specifications and performance metrics relevant to fire suppression system design. These tanks are suitable for integration with Tricel's fire pump systems,



Technical Specification Table

Technical Specification Tuble	
Specification	Details
Common Capacities	1,000 to 2,000,000+ litres
Typical Dimensions	Modular panels (1m² standard); custom configurations available
Tank Construction	GRP (Glass Reinforced Plastic) sectional panels
Insulation Options	Encapsulated CFC-free polyurethane foam
Thermal Performance (R-value)	Approx. R-6 to R-8 (varies by thickness and configuration)
Frost Resistance	Down to -15°C with insulation and frost protection covers
Flow Rate Compatibility	Designed to support sprinkler systems with flow rates from 1 to 100+ L/s
Pressure Compatibility	Compatible with systems up to 10 bar (custom options available)
Lead Times	2–6 weeks depending on size and site requirements
Certifications	LPCB, WRAS, BS EN 12845, BS EN 13280
Installation Type	Above-ground; internal or external; Totally Internally Flanged (TIF) models available
Maintenance Access	Manways, ladders, and hatches as standard
Monitoring Options	Level sensors, leak detection, remote telemetry (optional)



Fire Surpression Checklist

1. Legal & Regulatory Compliance		
Requirement	Status	Notes
Fire risk assessment completed		Required under RRFSO 2005
System design compliant with BS EN 12845 or BS 9251	0	Based on occupancy type
Approval Document B (Building Regs) reviewed		Fire protection strategy
Liaison with fire authority/Building Control		For approval if required
Insurer requirements met (e.g. LPCB)		Confirm with insurance
2. Design & Specification		
Hazard category determined (LH, OH, HH)		BS EN 12845 Annex II
Water demand calculated (flow & duration)		Typically 30–60 mins
Suppression method selected (sprinkler/mist/foam)		Depends on risk type
Zoning and floor-level protection planned		Account for compartmentation
Integration with alarm, BMS, and access control		Mandatory in many systems
3. Water Supply & Storage		
Mains water pressure tested		Assess suitability
Storage tank required	0	If mains pressure is inadequate
LPCB-certified tank specified (LPS 1276)		Mandatory for insurance compliance
Tank size confirmed (litres)		Based on risk category
Backflow protection and overflow fitted		Required by BS EN 12845
Access and insulation provisions made		For winter resilience



Fire Surpression Checklist

4. Pumps & Components		
Component	Status	Notes
Fire pump(s) sized to system demand		Flow rate + pressure
Standby pump installed		Redundancy recommended
Diesel/electric drive selected		Based on mains reliability
Pump house or enclosure installed		Frost protection included
Pump test line and flow meters included		For commissioning/testing
LPCB/BS EN certified components used		Pumps, valves, sensors
5. Installation & Commissioning		
Installation by qualified contractor		Preferably LPS 1048 approved
Pipework pressure-tested		BS EN 12845 requirement
Pump flow/pressure verified		Commissioning record kept
Control panel tested with alarms		Fault conditions simulated
Documentation provided (O&M manuals)		Essential for handover
6. Documentation & Compliance		
Risk assessment and fire strategy file		Reviewed annually
System design drawings (as-built)		CAD or PDF
Commissioning and test certificates		Keep for insurer/auditor
Maintenance logs and inspection records		Kept on file for 5+ years
Red Book Live product certificates		For LPCB-listed equipment

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TRICEL GENERATIONS OF INNOVATION

Routine Inspection &

Maintenance

A well-maintained fire suppression system ensures consistent performance, prolonged lifespan, and continued compliance with LPCB and BS EN 12845 standards. Tricel supports a full lifecycle approach to tank management, from installation through to end-of-life servicing and upgrades.

Scheduled Maintenance Overview

Regular inspections are essential to meet compliance and maintain readiness in the event of an emergency. The recommended schedule aligns with BS EN 12845 Annex K and LPCB requirements:

Frequency	Task
Weekly	Visual check of water level and pump status
Monthly	Inspection of valves, float switches, and overflow protection
Quarterly	Full functional test of pump system including automatic start-up
Annually	External tank inspection, pipework checks, alarm system testing
Every 10 years	Internal tank inspection, structural review, and internal cleaning

Spare Parts and Support

Tricel maintains a ready inventory of spare parts for all GRP fire suppression tanks and associated pump systems:

- Panel replacements (modular or TIF)
- Access hatches and inspection ports
- Level sensors, float valves, and overflows
- · Control panel components
- Pump system spares (impellers, seals, motor components)

Lifecycle Management

Tricel supports customers through the entire tank lifecycle:

- Installation phase: CAD drawings, commissioning, and compliance sign-off
- Operational phase: Monitoring systems, scheduled servicing, support access
- Upgrade phase: Retrofitting insulation, pump replacements, volume expansion
- End-of-life phase: Safe tank removal, recycling, and replacement planning



Frequently Asked Questions

Q: What is LPCB and why is it important for fire suppression systems?

A: LPCB (Loss Prevention Certification Board) is an internationally recognised certification body operated by BRE Global. It provides third-party certification for fire safety products. LPCB approval ensures products such as sprinkler tanks meet rigorous performance, manufacturing, and safety standards—required by insurers and fire authorities.

Q: What does LPS 1276 certification cover?

A: LPS 1276 is the LPCB standard for water storage tanks used in automatic sprinkler systems. It includes requirements for structural strength, leakage prevention, materials, factory production control, and long-term performance under fire conditions.

Q: Are Tricel fire suppression tanks compliant with BS EN 12845?

A: Yes. Tricel's LPCB-certified tanks are fully compliant with BS EN 12845, the UK and European standard governing the design, installation, and maintenance of automatic sprinkler systems in commercial and industrial environments.

Q: What is the typical lifespan of a Tricel LPCB-certified tank?

A: With proper maintenance, Tricel GRP fire suppression tanks can last 25 years or more, thanks to their corrosion-resistant materials and durable construction.

Q: Can Tricel tanks be used in retrofitting older buildings?

A: Yes. Tricel's Totally Internally Flanged (TIF) tanks and modular panel construction make them ideal for retrofit projects, especially in confined or difficult-to-access spaces.

Q: Are these tanks suitable for both sprinkler and misting systems?

A: Absolutely. Tricel offers models specifically designed to support both traditional sprinkler systems and low-pressure misting systems, depending on the fire suppression requirements of the building.

Q: How is the right tank size determined?

A: Tank sizing depends on the building's fire risk category, occupancy type, and the system's required flow rate and duration. Most commercial systems require 30 to 60 minutes of water storage, which equates to capacities ranging from 45,000 to over 1 million litres.

Q: What types of pumps can be supplied with Tricel tanks?

A: Tricel provides a range of compatible pump systems including end-suction, multistage booster, diesel-electric hybrid, and variable speed units. All pump sets are compliant with BS EN 12845 and BS 9251.



Frequently Asked Questions

Q: What is a duplex pump system?

A: A duplex system includes a main pump and a standby (backup) pump. This ensures uninterrupted system performance even if the primary pump fails or is offline for maintenance.

Q: How long does installation typically take?

A: Most installations can be completed in 1 to 5 days, depending on site access, tank size, and groundwork requirements.

Q: Can the tanks be installed indoors?

A: Yes. Tricel tanks can be installed indoors, especially the TIF models, which are designed for internal applications where external flanges would be impractical.

Q: Are the tanks frost-protected and insulated?

A: Tricel offers factory-fitted insulation and frost protection for all models, ensuring year-round operation even in exposed environments.

Q: Can remote monitoring be added to Tricel tanks?

A: Yes. Tanks can be fitted with IoT-enabled sensors for real-time monitoring of water levels, temperature, and system alerts. This helps facilities teams stay proactive with system performance and compliance.

Q: Where are Tricel tanks manufactured?

A: Tricel fire suppression tanks are manufactured in ISO 9001-certified facilities in the UK and Europe, ensuring consistent quality and traceability.

Q: Are Tricel's tanks listed in Red Book Live?

A: Yes. All LPCB-approved Tricel sprinkler tanks appear in the Red Book Live, the official directory of certified fire safety products used by insurers, specifiers, and regulators.

TRICEL GENERATIONS OF INNOVATION

Case Studies

Case Study 1: Logistics Distribution Centre – West Midlands, UK

A national logistics firm operating a 12,000 m² warehouse required an LPCB-compliant sprinkler system to satisfy their insurer's fire protection criteria for a Category 4 risk site. The local mains water supply was inadequate to meet the sprinkler demand.

Tricel Solution:

- Supplied a 400,000-litre LPCB-certified GRP sprinkler tank with a modular design for transport and rapid assembly.
- Installed with a duplex pump system (main and standby) housed in a purpose-built plant room beside the tank.
- The design also included dual level switches, overflow protection, and a tamper-proof inlet.

Result:

The system achieved full LPCB compliance and passed insurer inspection on first review. The customer also opted for a Tricel maintenance package to ensure long-term reliability.

Case Study 2: Primary School Retrofit – County Clare, Ireland

As part of a Department of Education retrofit programme, a rural primary school required a fire suppression upgrade. The remote location lacked consistent mains pressure, necessitating an onsite water storage solution.

Tricel Solution:

- Installed a 120,000-litre LPCB-certified sprinkler tank tailored to fit within the school's limited service yard.
- Provided a compact booster pump set with battery-backed control panel and flow test line.
- Delivered prefabricated access ladders and frost protection covers for lowmaintenance operation.

Result:

The compact tank and pump system integrated seamlessly into the existing fire infrastructure with minimal disruption during term time. The school met all statutory fire protection requirements and qualified for fire insurance rebates.



Case Studies

Case Study 3: Healthcare Campus Expansion – Greater Dublin Area

A private hospital expanding its oncology wing needed a high-capacity fire suppression system to comply with fire authority guidelines. Given the critical nature of patient services, the system required redundancy, rapid response, and 24/7 reliability.

Tricel Solution:

- Delivered two interlinked 250,000-litre LPCB sprinkler tanks to provide redundancy and operational flexibility.
- Installed a multi-pump control system with automatic switch-over, integrated into the hospital's BMS (Building Management System).
- Included full insulation, trace heating, and remotely monitored level sensors.

Result:

The hospital now benefits from a fully compliant, high-availability fire water supply that integrates with their building's safety protocols.

Case Study 4: Hotel sprinkler tank installation - London

Firmdale Hotels required a reliable, modern replacement for their ageing sprinkler tank at Ham Yard Hotel. The existing tank had reached the end of its service life, and a new solution was needed quickly to ensure continuous fire protection.

Tricel's Solution

- Supplied a hot-press moulded GRP tank, sized 4m ×2m ×2m, with a nominal capacity of 16,000 litres (providing 12,000 litres of usable water).
- Used a Totally Internally Flanged (TIF) base design ideal for compact, internal plant rooms common in city-centre hotels.
- Coordinated project from order to commissioning to ensure minimal disruption in the operational hotel environment.

Result

- Tricel completed the design, delivery, and installation on schedule.
- The hotel now benefits from a dependable, LPCB-compliant water storage solution that meets current fire safety standards—without impacting guest operations.



Conclusion

Designing a resilient fire suppression system is a critical component of building safety—especially in commercial, public, and industrial environments where downtime or non-compliance can lead to catastrophic consequences. Water storage is often the cornerstone of these systems, and Tricel's LPCB-certified tanks offer a reliable, compliant, and scalable solution for ensuring sustained fire protection.

From GRP panel construction and Totally Internally Flanged options to integrated pump systems and frost-protected installations, Tricel delivers both versatility and performance. Supported by in-depth lifecycle services, rapid lead times, and nationwide expertise, the company has become a trusted partner in fire suppression across the UK and Ireland.

Whether specified for a new development or as a retrofit solution, Tricel's tanks meet the highest industry standards—including LPS 1276, BS EN 12845, and, where applicable, WRAS—ensuring peace of mind for contractors, insurers, and end users alike. Through continuous investment in product development and digital monitoring technologies, Tricel remains at the forefront of safer, smarter fire protection.

For more information, or to request a tailored quote, contact our fire suppression team today.

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