



WHITEPAPER

An Overview of Category 4 Sprinkler Systems

AUTHOR:



Amos Thomas
Director, Harmony Fire



the fire protection experts.



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An Overview of Category 4 Sprinkler Systems

Introduction

Category Comparisons:

- **Category 1:** Individual dwellings, e.g., single-family homes. Smaller tanks (1-1.5 m³) and a 10-minute water supply.
- **Category 2:** Flats below 18m. 30-minute supply and tank size of 3-4.5 m³.
- **Category 3:** Care homes and dormitories. Higher flow rates (168-200 litres/min), with tank sizes of 6-9 m³.
- **Category 4:** High-rise flats (18m+). Highest water flow rates (400 litres/min) and largest storage requirements (10-30 m³ across two tanks).

Why Was Category 4 Introduced?

Category 4 was introduced following the Grenfell Tower tragedy to enhance fire safety in residential buildings over 18m in height. It aims to:

- Improve resilience and mitigate risks in high-rise buildings.
- Align with Fire and Rescue Service access and response time guidance.
- Ensure compliance with BS 9251:2021 standards for residential sprinkler systems.

What Differentiates Category 4?

Key differences from other categories include:

1. **Water Supply Duration:** Category 4 systems require a **minimum of 60 minutes** of stored water supply.
 - a. This involves **two water tanks**, each holding half the total capacity (typically 10-30 m³).
2. **Pumps:** Systems must include **duty and standby pumps** that can draw water from either tank.
3. **Backup Power:** A **backup power source (Uninterrupted Power Supply - UPS)** and automatic switchover are mandated to ensure system operation during a mains power failure.

Other differences include sprinkler head placements in **plant rooms, communal areas, and bike sheds** (if required by construction linings), which are not typical in lower categories.

System Features for Category 4:

- **Sprinkler Heads:** Calculations based on 2-4 operating simultaneously at 400 litres/min.
- **Tank Isolation:** Components can be isolated for maintenance without affecting system operation.
- **Monitoring:** Systems include monitoring panels connected across building entrances.



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How do I comply with the BS 9251:2021 changes?

Sprinkler systems falling under this category must be equipped with a backup power source and automatic switchover capability. This entails having two power supply sources: a mains power connection serving as the primary source, and an uninterruptible power supply (UPS) serving as the secondary source. An automatic transfer switch should be in place to seamlessly shift the load from the mains to the UPS in the event of a mains power failure while the sprinkler system is operational.

Given that backup power supplies, such as UPS systems, are already mandated for other life safety systems with specified autonomy and runtime recommendations (including alarm systems, extinguishing systems and emergency and exit lighting), it was inevitable for BS 9251 to have these added as part of their revisions, incorporating more strict safety guidelines for sprinkler systems as well.

Following the Grenfell tragedy in 2017, significant resources were allocated to enhance the safety of occupants and visitors in high-rise buildings. Whilst the amendment to BS 9251 regulations refers to new constructions, it is highly advisable for existing buildings to consider updating their sprinkler systems to enhance the safety of their residents and visitors.

Case Studies

[The FPA - Sprinkler Save at fire in Doncaster tower block](#)

“South Yorkshire Fire and Rescue attended a fire at Hatfield House, Balby Bridge just before midday on 26 April, caused by hair straighteners setting fire to some bedding. The occupant was able to evacuate the premises safely, and the fire was already out when firefighters arrived on the scene thanks to sprinklers which had been fitted throughout the building. Fire officers say the incident highlights the value of fire sprinklers fitted in high-rise, residential buildings.”

[The FPA - Another Southampton Sprinkler Save](#)

“Firefighters from the newly combined Hampshire and Isle of Wight Fire and Rescue Service were called to a fire in a flat on the 21st floor of a tower block in Southampton this week. The first crew was on scene within three minutes and found that a cooker fire in the kitchen was already out on arrival thanks to the sprinkler system installed.”

[The FPA - Myth Buster](#)

“According to recent statistics, sprinkler systems have a performance effectiveness of 99% across all building types, whilst 95% of fires are controlled or even extinguished by the operation of fewer than five sprinklers, debunking the myth that if one sprinkler goes off then all of them will¹. Sprinklers are one of those things that are taken for granted or dismissed. People either understand them and see the true benefits of them, or don't understand them and too quickly dismiss them without really being able to justify why.”



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Summary:

Category 4 systems are designed for enhanced reliability and failover redundancy, meeting stringent [BS 9251:2021](#) requirements. These systems provide comprehensive fire protection for high-rise buildings, ensuring sufficient water supply, power continuity, and robust system performance.

References:

<https://www.southwales-fire.gov.uk/your-safety-wellbeing/in-business/sprinklers/categories-of-sprinkler-systems/>

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<https://www.sprinklersdirect.co.uk/bs9251/>

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