

Application Bulletin: **Archive Storage Rooms** • Technology: **FirePro Condensed Aerosol**

Application
Archive Storage Rooms

The Risk
Concentrations of combustible materials such as paper, cardboard, photographic media and packaging, often combined with high-value, irreplaceable contents including historical records, legal documents and sensitive data.

This Bulletin Covers
- Design considerations
- Environmental requirements
- End user responsibilities
- Post-discharge procedure
- Myths & comparative analysis

Mandatory Message to End Users
"All archive materials must be stored in closed, protective containers or archival-quality enclosures wherever possible."

Condensed Aerosol Fire Suppression in Archive Storage Rooms

Design Considerations, Environmental Requirements, End User Responsibilities, Myths & Comparative Analysis

1. Introduction

Archive storage rooms present a unique fire risk due to the concentration of combustible materials such as paper, cardboard, photographic media, and packaging. These risks are often combined with high-value, irreplaceable contents including historical records, legal documents, and sensitive data. Fire spread in archives can be rapid, and even minor incidents can result in catastrophic loss.

FirePro condensed aerosol (CA) technology provides an effective, LPCB-certified suppression solution for archive environments, particularly where traditional water-based systems pose unacceptable risks to stored materials and gaseous systems are impractical due to cost or room integrity requirements.

This bulletin outlines the design considerations, environmental requirements, end user responsibilities, and key considerations for FirePro systems in archive storage applications.

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2. Purpose of FirePro in Archive Storage Environments

FirePro is designed to:

- Rapidly suppress fire at its earliest stage
- Prevent fire spread across densely packed materials
- Protect high-value and irreplaceable contents
- Minimise disruption and loss

However, FirePro is **not designed to protect materials from non-fire-related degradation** (e.g. humidity, ageing, or environmental exposure).

> **Therefore:**
> *FirePro must be part of an overall archive preservation strategy, including environmental control and good storage practices.*

This must be clearly communicated during system design and handover.

3. Important Note on Residue and Sensitive Materials

FirePro is not a clean gas agent and does not provide zero-residue discharge.

A light, dry aerosol particulate may settle on surfaces after activation. In archive environments, this may result in:

- Light residue on shelving and storage containers
- Surface deposits on document covers or packaging
- Possible contamination of exposed or unprotected materials

> **Mandatory message to end users:**
> *"All archive materials must be stored in closed, protective containers or archival-quality enclosures wherever possible."*

This is a mandatory operational requirement.

4. Why Sprinklers and Water-Based Systems Are Unsuitable for Archive Storage

Water-based systems pose significant risks to archive materials.

4.1 Irreversible Damage to Documents

- Paper, books, and records are highly water-sensitive
- Ink may run, documents may warp, and information may be permanently lost

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4.2 Widespread Collateral Damage

- Sprinklers activate across large areas, affecting multiple storage zones
- Water damage often exceeds fire damage

4.3 Mould and Long-Term Degradation

- Moisture leads to mould growth and deterioration of materials
- Restoration can be complex, expensive, or impossible

4.4 Water Mist Limitations

- Even fine droplets can damage sensitive paper and media
- Introduces humidity into controlled environments

5. Why FirePro Is Well Suited for Archive Storage Rooms

FirePro offers key advantages in protecting sensitive archive environments.

5.1 No Water or Moisture

Eliminates risks of:

- Document saturation
- Ink damage
- Mould growth

5.2 Rapid Fire Suppression

- Quickly controls flame spread in paper-based materials
- Effective in high-density storage areas

5.3 Minimal Collateral Damage

- No liquid discharge
- No mechanical impact on fragile materials

5.4 No Cylinders or Pipework

- Ideal for compact archive rooms or retrofit installations
- Minimal disruption to existing storage layouts

5.5 Minimal Pressure Rise

- No need for pressure relief venting
- Suitable for standard archive rooms

5.6 High Leakage Tolerance

- Effective in rooms with typical building leakage

5.7 Long 15-Year Life

- Reduced maintenance and lifecycle cost

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6. Archive Protection Requirements (Mandatory)

6.1 Proper Storage Practices

- Documents must be stored in:
  - Archival-quality boxes
  - Closed shelving systems
  - Protective covers where possible

6.2 Environmental Control

- Temperature and humidity must be managed
- Prevent condensation and degradation

6.3 Housekeeping and Organisation

- Avoid over-stacking or blocking airflow
- Maintain clear aisles and access

6.4 Detection Systems

- Early detection is critical (e.g. smoke detection, VESDA recommended)

6.5 HVAC Integration

- Ventilation systems must shut down upon activation

7. Environmental Conditions

Maintaining stable environmental conditions improves both preservation and FirePro performance:

TEMPERATURE	HUMIDITY
Typically 16–20°C for archive storage	Controlled (typically 40–60% RH)
AIRFLOW	**POST-DISCHARGE VENTILATION**
Must stop during discharge	Ventilate within 10–15 minutes

8. Design Considerations for Archive Storage Rooms

8.1 Fire Load and Storage Density

- High-density paper storage increases fire intensity
- Consider shelving layout and packing density

8.2 Enclosure Volume and Leakage

- Full room volume must be calculated
- Apply leakage compensation

8.3 Aerosol Generator Placement

- Ensure uniform distribution throughout shelving areas
- Avoid obstruction by dense storage systems

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8.4 Detection and Control Integration

- Early warning detection strongly recommended
- Integration with:
  - ◆ Fire alarm systems
  - ◆ HVAC shutdown
  - ◆ Access control systems

8.5 Compartmentalisation

- Large archives may require zoned protection
- Prevent fire spread between storage areas

9. Post-Discharge Procedure

1. Secure and isolate the area
2. Ventilate the room within 10–15 minutes
3. Inspect stored materials for exposure
4. Clean surfaces:
   - Shelving
   - Floors
   - External surfaces of containers
5. Assess any exposed documents for conservation needs
6. Recommission FirePro system

10. Common Myths & Factual Counterpoints

Myth 1: "Aerosol systems will damage archive materials."

Fact: FirePro produces a dry particulate that has minimal impact when materials are properly stored in protective enclosures.

Myth 2: "Water is acceptable because it extinguishes fire completely."

Fact: Water causes irreversible damage to archives, often exceeding the damage caused by fire itself.

Myth 3: "Gas suppression is always better for archives."

Fact: Gas systems require airtight environments and significant infrastructure. FirePro provides effective protection without these constraints.

11. Transparency Statement

FirePro UK maintains full transparency:

- FirePro is designed to suppress fire, not preserve exposed materials

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- FirePro is not a zero-residue agent; a light particulate will be present
- All archive materials should be stored in protective enclosures
- Post-discharge inspection and cleaning are required
- FirePro does not prevent environmental degradation
- FirePro is not certificated for deep-seated fires in tightly packed materials
- FirePro introduces no water, avoiding catastrophic damage to archived content

12. Summary

FirePro condensed aerosol provides an effective and practical fire suppression solution for archive storage rooms, where the risks associated with water-based systems are unacceptable and gaseous systems may be impractical.

Its ability to suppress fire rapidly without introducing moisture makes it particularly well suited for protecting sensitive and irreplaceable materials.

However, successful protection depends on:

- Proper storage practices
- Environmental control
- Early detection
- Post-discharge cleaning and inspection

> **Key operational requirement:**
> *All archive materials should be stored in protective containers to minimise any potential impact from aerosol residue.*

If you would like to learn more about FirePro, or discuss an archive storage application, please visit us at **www.fireprouk.com** – see contact details below.

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