



# Protection of Heritage Buildings with water mist

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# Agenda

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- Recent incidents
- Why fire protection
- Modern fire protection systems versus old structures
- Why water mist systems
- Fire protection test protocols / approvals
- Advantages over other fire protection systems
- Practical challenges during installation
- Project examples

# Recent Incidents

## MAJOR INCIDENTS DURING LAST COUPLE OF YEARS



Brazil National Museum  
as much as 80% of the  
collection destroyed in fire



Notre Dame, Paris  
Roof and spire destroyed;  
windows and vaulted  
ceilings damaged

# Why Fire Protection?

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- Historic/heritage buildings are the physical remains that represent the past
- No change to rebuild
- Once lost can't be replaced
- Prevent historic building damage due to fire

# Modern fire protection systems versus old structures

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- Impact on the historic constructions
- Impact on historic integrity of the building
- Pipes and wires and conduit running across architecturally
- Damage from water based fire protection systems

# Why water mist systems

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- Effective due to less water
- Small water tank
- Small pump unit foot print
- Performance based systems
- Easy piping routing by small pipe diameters
- Established and proven technology
- Approved by AHJ

# Fire protection test protocols / approvals



- |               |                            |
|---------------|----------------------------|
| ■ NFPA 750    | LH Risk, Hotels / Museums  |
| ■ VdS 3188    | OH Risks, Hotels / Museums |
| ■ VdS CEA4001 | OH Risks, Hotels / Museums |
| ■ FM5560      | HC1, Hotels / Museums      |
| ■ prEN-14972  | OH Risks, Hotels / Museums |
| ■ BS8489      | Churches                   |
| ■ CNPP        | Archives                   |

*“One of the greatest challenges to engineering of water mist fire suppression systems lies in determining whether the conditions of a particular test protocol are representative of the actual conditions in a given application.*

*The safe use of a water mist system is limited to applications it has been tested for.”*

## Performance Based Systems testing for specific applications

# Advantages over other fire protection systems



Agent	Advantages	Disadvantages
Water Mist systems	High cooling effect Low water consumption Small pipe diameters Small pump skids	Installation cost (high pressure) Limited test protocols Need for performance based testing
Conventional Sprinkler systems	More test protocols	High water consumption Large pipe diameters Large pump skids Large water tank
Gaseous systems	Economic for smaller risks	Enclosure integrity Reduced cooling effect Large enclosures: <ul style="list-style-type: none"><li>• high installation costs</li><li>• maintenance costs</li></ul>



# Challenges during installation

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- Old building structures
- Installation during building opening
- Ceiling heights
- Step by step installation
- Bring pump skid in
- Piping should not be visible

# Project examples



## ■ Projects

- Historic Library / Archive protection, Weston Library
- Historic building in use as apartment building, Casa Codina

## ■ Performance based testing



Weston Library, Oxford



Casa Codina, Barcelona

# Project examples



## ■ University of Oxford, Weston Library

- The objective was to protect the entire building, where the risk of deep-seated fires and complex layouts pose a greater challenge.
- The University of Oxford required low quantities of water to fight, control, and extinguish the fire. In comparison to more traditional sprinkler systems, water damage can be alleviated by vaporizing and reducing the size of water droplets.
- Water Mist technology also features smaller pipes, making the system easier to install in environments with limited space and facilities



# Project examples



## ■ Casa Codina, Barcelona

- The objective was to protect the entire building.
- The building owner was required by the local fire department to install a fire suppression system were the building owner required low quantities of water to fight, control and suppress the fire.
- Water Mist technology also features smaller pipes, making the system easier to install in environments with limited space and facilities



# Thank You



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