

High Pressure Water Mist in High Rise Buildings



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Introduction



- Founded in 1988
- One of the 5 large sprinkler installation companies in France



We found high pressure water mist technology to be advantageous for certain applications



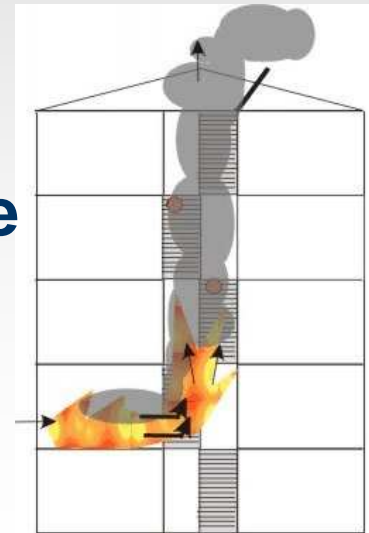
Introduction

High Rise Buildings

- Buildings with floors higher than 22 m
- Long staircases and funnels of escalators, garbage and electricity
- Escape ways of 50 m per floor



Greater threat of smoke, heat and fire spread across levels



Legal Regulations

Installation of an automatic fire fighting system obligatory

- **In France (Amendment of 2009)**
 - High rise buildings > 200 m
- **In Germany**
 - High rise buildings > even 60 m



Fire Hazard Class

- **Belong to group of fire hazards OH 1**
- **Usually have no fire fighting system or are equipped with Sprinkler System**
- **Characteristics of a Sprinkler System**
 - **High water consumption**
 - **Water damages**
 - **Compensation of pressure loss by additional pumps**

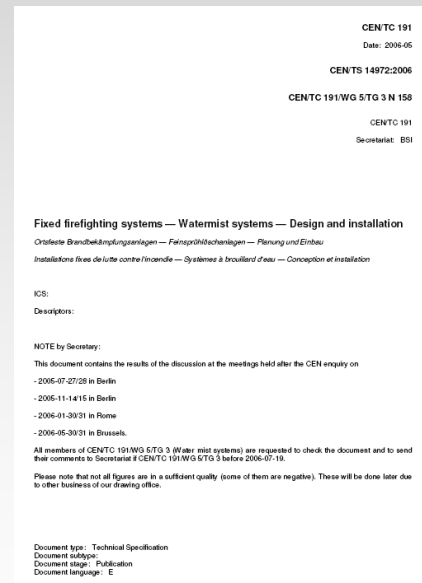
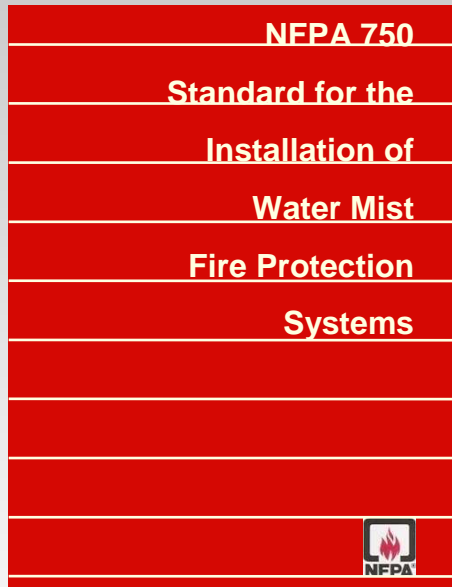
High Pressure Water Mist Systems

Advantages for applications with OH-1 risks

- Reduced water discharge, thus water damage
- High cooling effect, thus protection of exposed glass and steel structures
- Easy retrofit with small bore pipework
- No or small water storage requirements
- Reduced hydraulic restrictions
- One central pump station



Standards & Guidelines

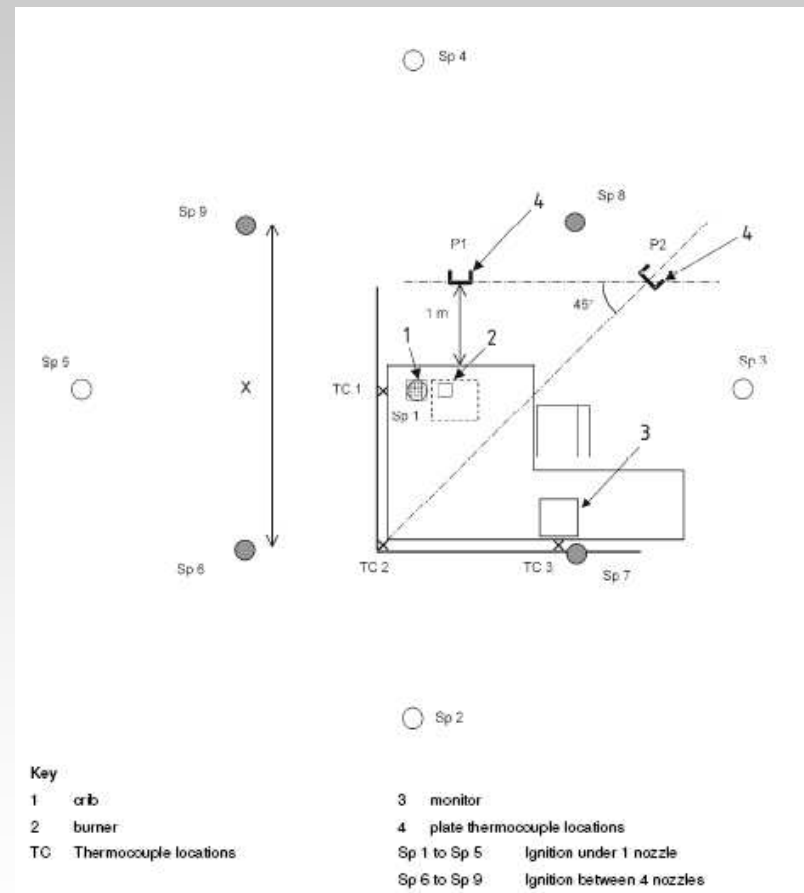


- NFPA 750 defines requirements for system components and general design procedures
- CEN TS 14972 defines specific fire tests scenarios for system acceptance

OH-1 Fire Tests

Fire test arrangement for OH-1 in accordance to CEN TS 14972

- Performance comparison tests to conventional sprinklers
- Aim is control and suppression of the fire
- Tests under one and between four nozzles
- Gas temperatures and fire damage to the fire load is compared for 30 minutes system operation



OH-1 Fire Tests

Fire Load

Combustible material	Item
Wood	Table plates
	Wall panel
	Drawer
	Chair (frame)
Paper	Filed paper
	Books
	Newspaper
Polyether foam	Chair (padding)
	Simulated files
Electronics	Monitor and keyboard



OH-1 Fire Tests

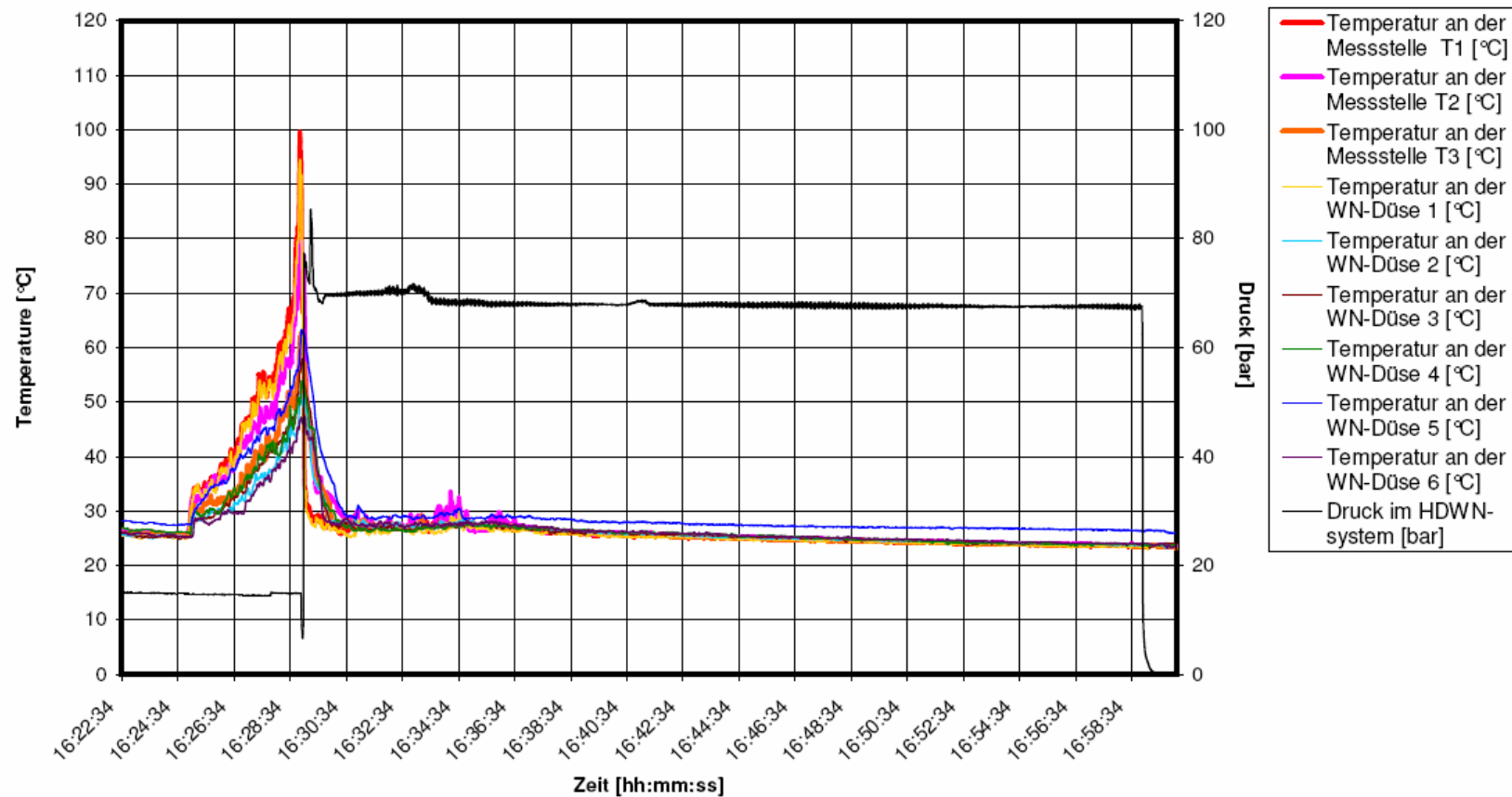


Fuel package after sprinkler fire test

Fuel package after water mist fire test



OH-1 Fire Tests



Comparison of Pipe Dimensioning

Conventional OH-1 Sprinkler

- Nozzle flow rate is min. 60 l/min
- Permissible pipe pressure loss is < 5 bar

OH-1 Water Mist System

- Nozzle flow rate is 30 to 40 l/min
- Permissible pipe pressure loss is < 70 bar

**Substantially larger pipe sizes and height limitations for sprinklers,
thus installation restrictions**

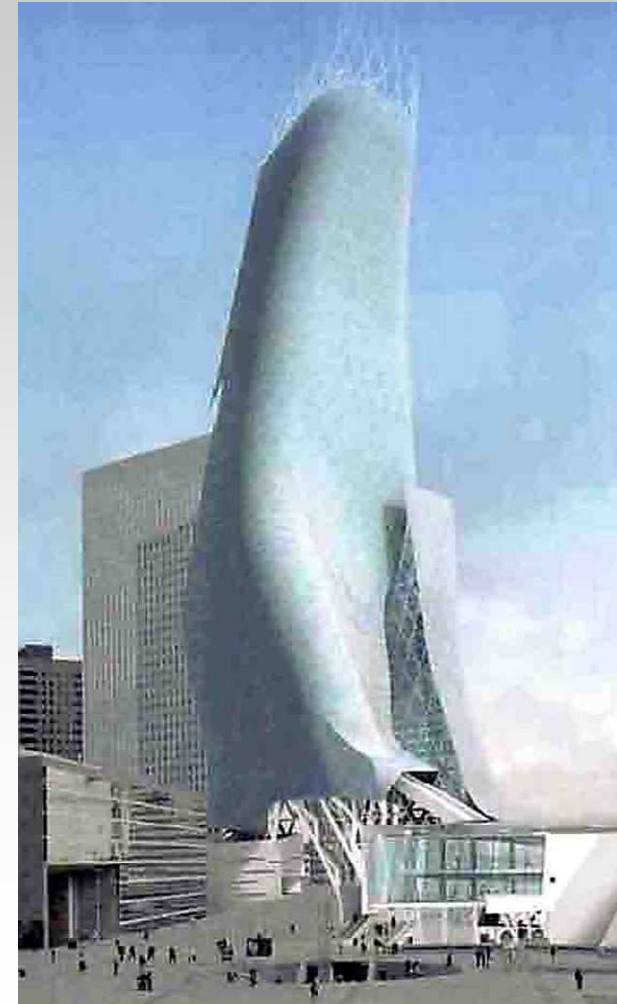
Example for a High Rise Building

Study case of the Future “Phare” Tower in Paris

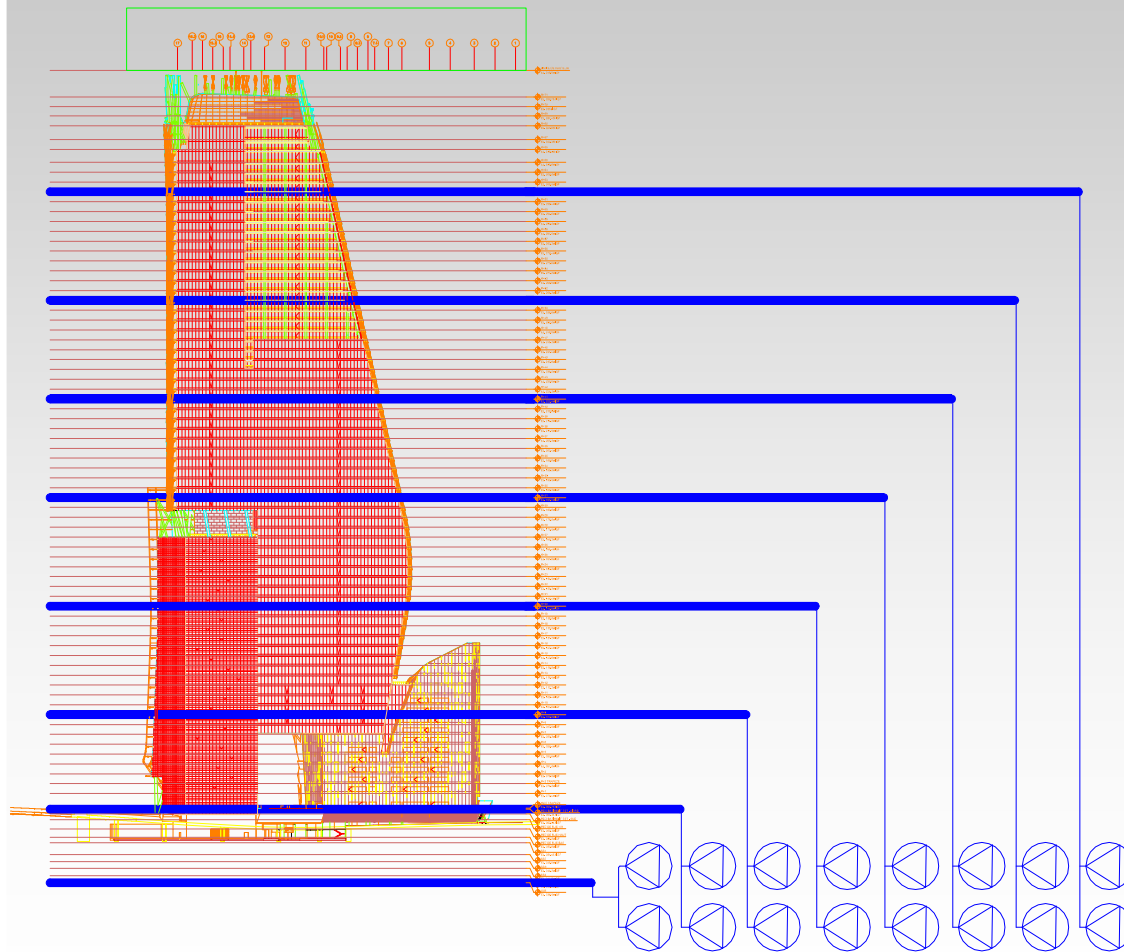
- > 300 m Height
- 71 floors



**Comparison between
Sprinkler and HPWM
System**



Phare Tower Concept



Sprinkler system

- Every 45 m of building height
 - + Main riser pipe
 - + Pump unit & Redundant pump unit
 - + Section Valve
- For the project:
 - 2 x 10 diesel pumps
= 98 m³/h at 11-34 bar

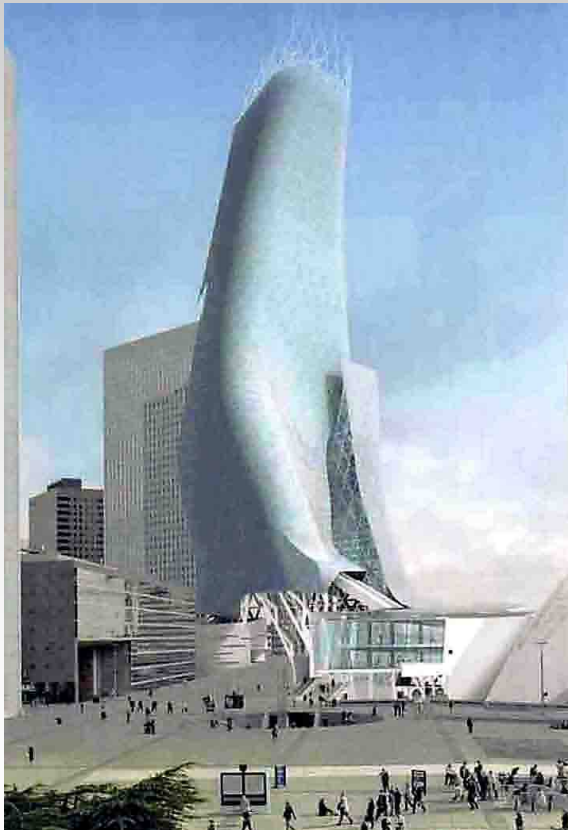
Phare Tower Concept

Type	Level	Amount of section pipes	
		Sprinkler	Water Mist
Air	Car Parking -5,-4,-3,-2	1	1
	-6 to 00	2	2
Water	0 to +9	3	
	10 to 20	4	
	Atrium	5	3
	21 to 31	6	2
	32 to 42	7	
	43 to 53	8	
	54 to 64	9	
	55 to 70	10	

Phare Tower Concept

	Sprinkler	Water Mist
Area	216 m ²	216 m ²
Nozzle	12	26
Flow Rate	5 l/min/m ²	1,46 l/min/m ²
Nozzle flow Rate	60 l/min	38 l/min
Total	1320 l/min	380 l/min
Pressure loss	<5 bars	<70 bars
Tanks	79200 l	22800 l

Advantage of HPWM



- Installation less bulky
 - Piping hideable by installation underneath floors
- Very good cooling effect
 - Protection of glass and steel structure
- Lower flowrate, thus water storage and damages
- Lower maintenance costs



PRICE ADVANTAGE

Thank You for Your Attention