



Fire Fighting with Water Mist

Company



- **Company**
- Technology
- Research & Development
- Products
- Applications

Company – FOGTEC Services



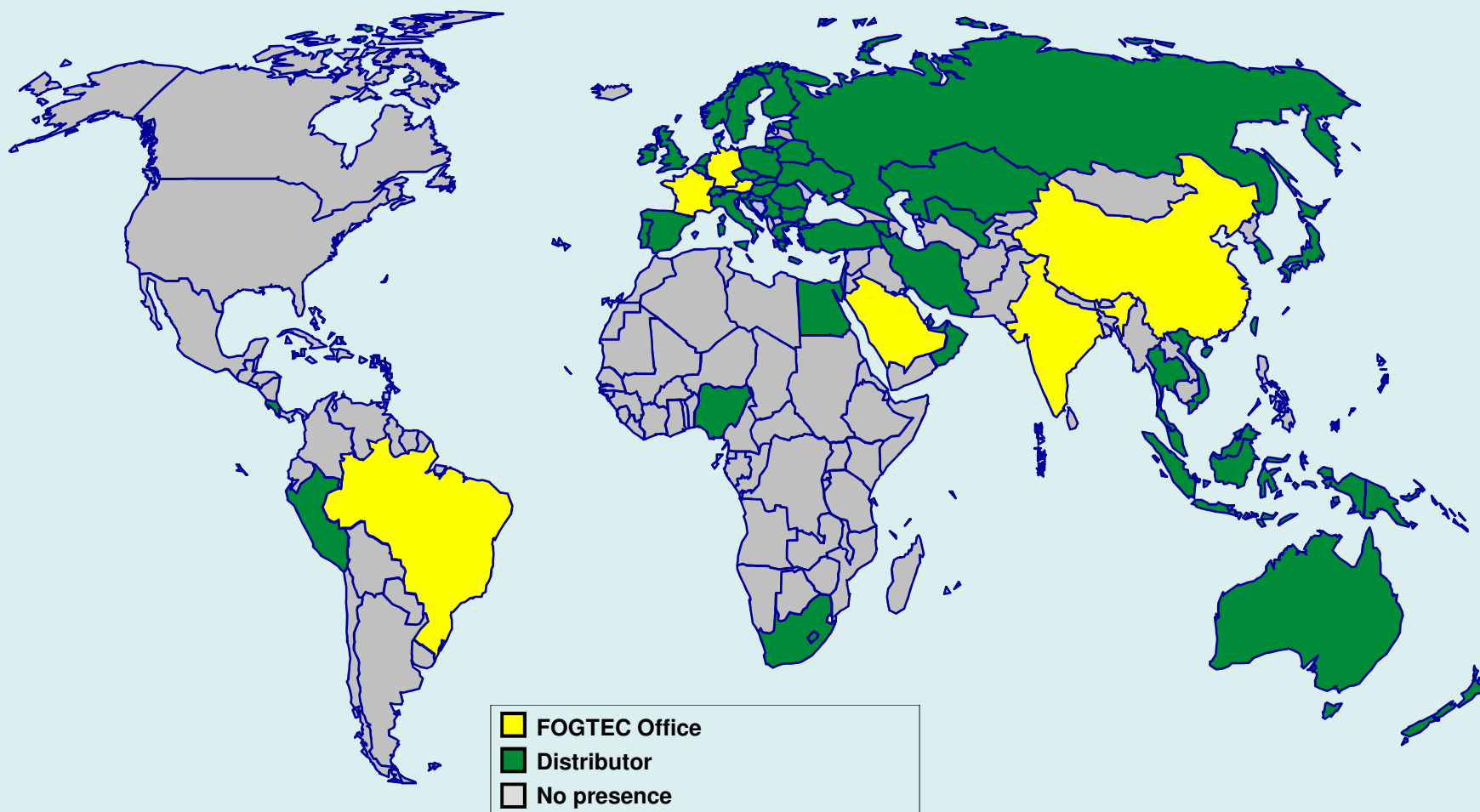
- Private German company with headquarter in Cologne
- Water mist system component development and manufacturing
- Application fire testing, component testing and system approval
- International market presence by own offices or system partners
- System design and planning
- Installation (direct or via local partners)
- After sales service and maintenance

Company – FOGTEC Set Up

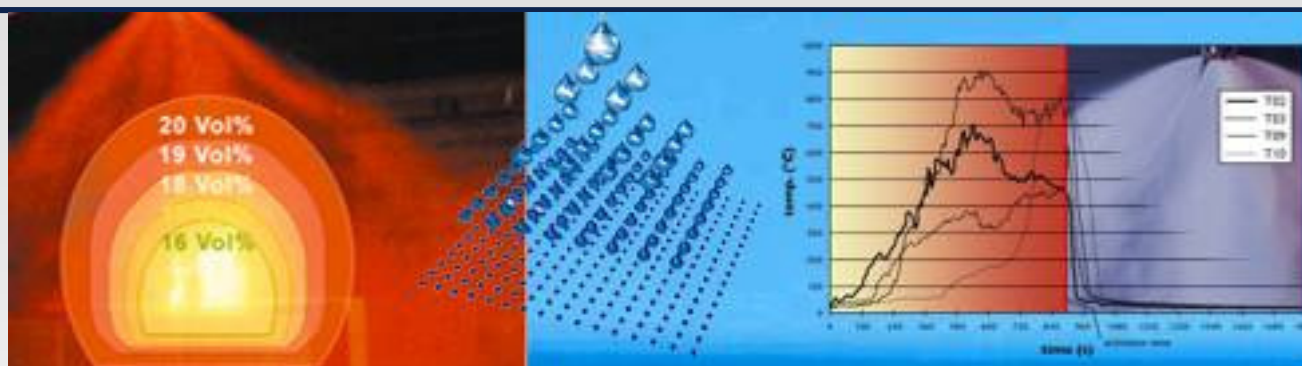


- **Head Office in Cologne, Germany**
- **R+D Office (IFAB) in Berlin, Germany**
- **Office France in Paris, France**
- **Office Middle East in Jeddah, Saudi Arabia**
- **Office South East Asia in Mumbai, India**
- **Office China in Shanghai, China**
- **Office South America in Sao Paulo, Brasil**

Company – Market Presence



Fire Fighting with Water Mist

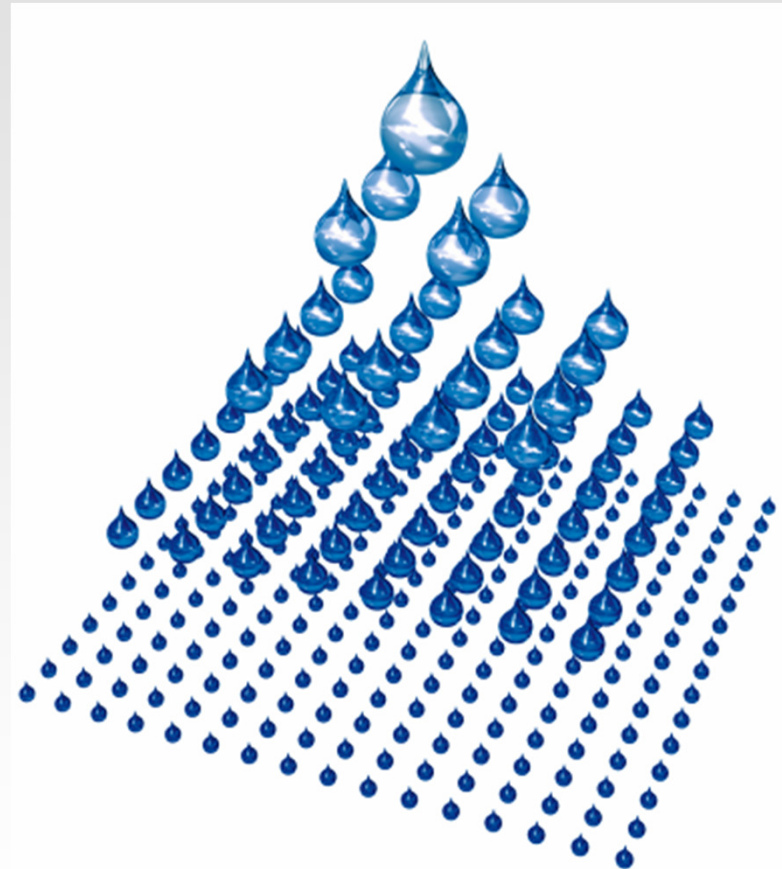


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Technology – Small Droplets - Big Effect

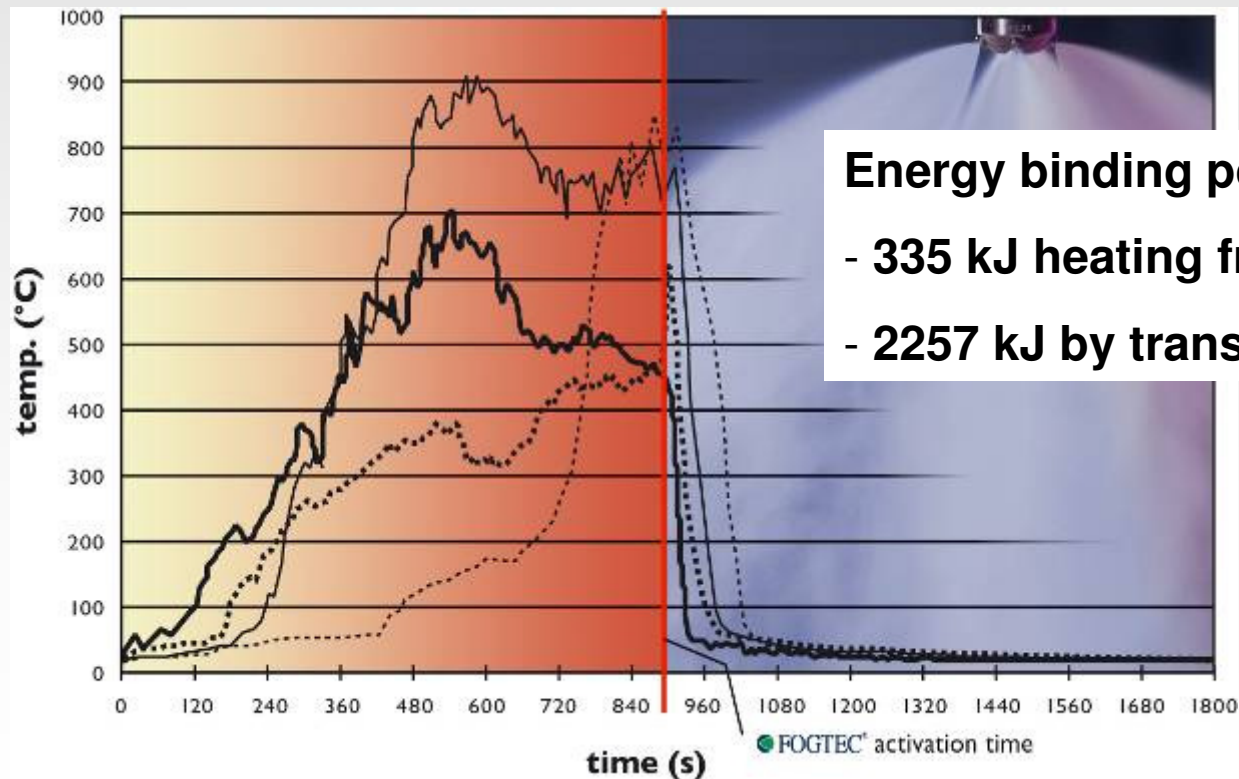
- Cooling by heat absorbtion via large surface
- Inerting by local oxygen displacement

| Droplet Diameter | | Reaction surface per litre of water |
|------------------|---|---|
| 1mm | ⇒ | 2m ² (Convent. Technologies) |
| 0,1mm | ⇒ | 20m ² |
| 0,01 mm | ⇒ | 200m ² (FOGTEC Water Mist) |



Technology – Cooling / Radiant Heat Attenuation

- Safe environment for people
- Protection of nearby objects from radiant heat
- Prevention from flash over



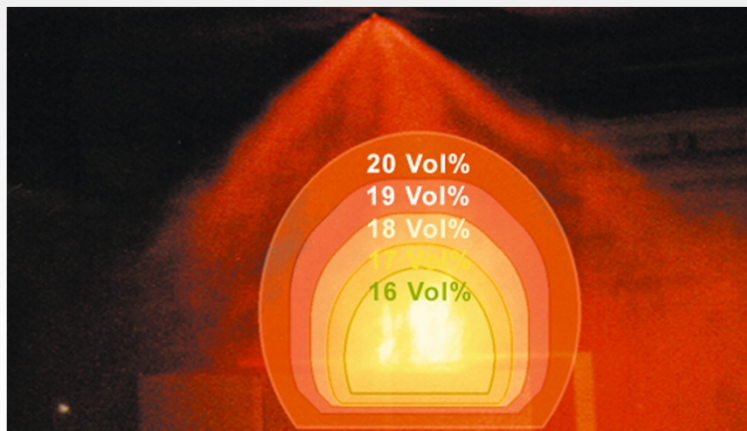
Energy binding potential of 1 l of water:

- 335 kJ heating from 20°C to 100°C
- 2257 kJ by transition from liquid to gas

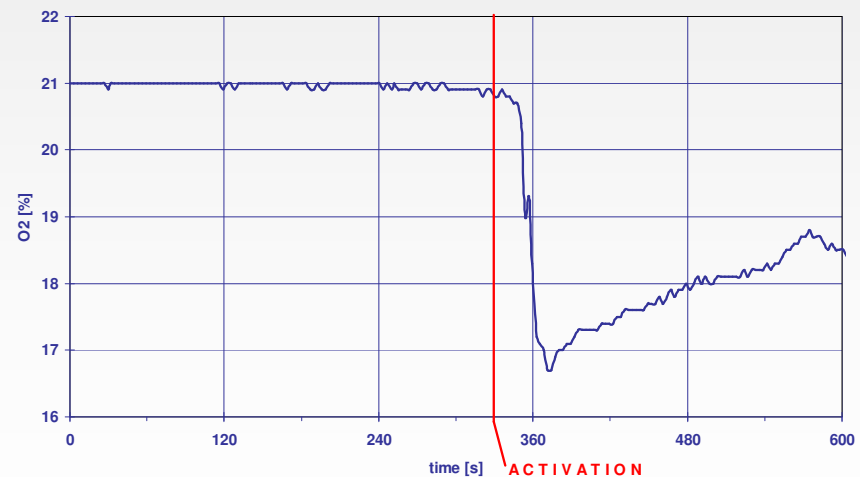
Technology – Inerting by Local Oxygen Displacement

„Suffocation“ of the fire by displacement of oxygen at the fire source

Volume enlargement of 1 litre of water by evaporation:
1 l, liquid \Rightarrow 1650 l, gaseous



Oxygen reduction only at the source of the fire



Technology – Absorption of Smoke

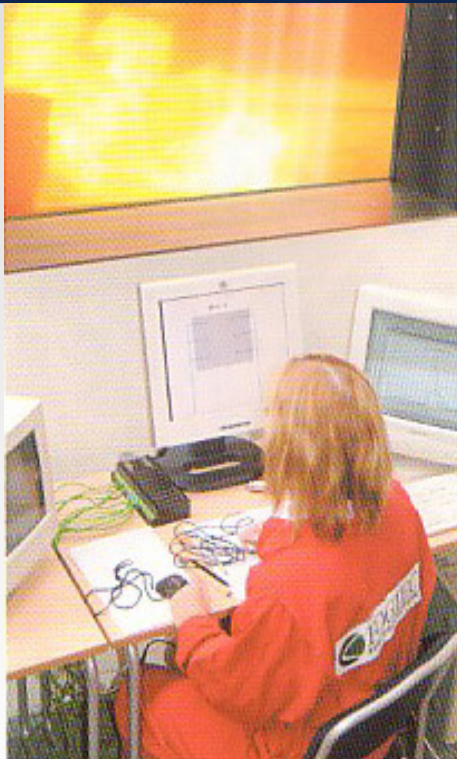
- Binding of smoke particles by small droplets
- Washing out of gases (e.g. HCL) via huge reaction surface
- Less contamination by smoke



Technology – System Benefits

- **Safe for personnel / No pre-warning time required**
- **Effective fire fighting / Reach of hidden fires**
- **Rapid and uniform cooling of hot surfaces and surrounding areas / No re-ignitions**
- **Negligible effect on electronic and electrical components**
- **Minimal water consumption**
- **Minimal business interruption**
- **Easy installation / Retrofit with small bore pipes as room protection**

Fire Fighting with Water Mist



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R&D – Guidelines and Standards



Systems are tested and installed in accordance with

- NFPA 750
- FM 5560
- CEN TS 14972 (VdS, CNPP,...)
- IMO standards

R&D – Approvals / Independent Fire Tests



Approvals

- Machinery spaces (IMO MSC 668/728)
- Local Applications (IMO MSC 913)
- Accommodation Areas (IMO A 800)
- Gas Turbines (FM)
- Deep Fat Fryers (NVBB and GL)
- CNC Machines (VdS)
- Flammable liquid areas (VdS)
- Transformers (VdS)
- OH1, OH3 (VdS)

Independent Tests

- Archives (ISV, CSTB)
- Engine Test Cells (TÜV)
- Industrial Ovens (ISV)
- Cable Tunnels (TÜV)
- Flammable Liquid Stores (ISV)
- Diesel Generators (ISV)
- Raised Floor / IT Rooms (ISV, TÜV)
- High Voltage Areas (IBEXU)
- Wind Turbines (AGM)
- Filters (HP)
- Paint Cabinets (ISV)
- Escalators (Chiltern Fire)

Fire Fighting with Water Mist



- Company
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- Research & Development
- **Products**
- Applications

Products – Nozzles



- Nozzle spray pattern adapted to the risk
- Open nozzles in dry pipe systems
- Glass bulb operated nozzles in wet pipe systems
- Caps for each micro nozzle possible
- Easy mounting and maintenance



Products – Wall Cabinet



- **Combination of fixed and mobile water mist systems**
- **Effective fire suppression at strategic places ready to use**
- **Easy handling**
- **Unlimited operation time**

Products – Pipework and Section Valves



- **Diameters from 12 mm - 50 mm**
- **Stainless steel AISI 316**
- **High durability**
- **No contaminated water when discharged**
- **Low maintenance requirements**
- **Solenoid or pneumatically operated section valves**

Products – Cylinder Systems



- Filled with demineralised water
- Nitrogen as propellant at 200 bar
- Cylinders with internal lining
- 20 / 50 / 80 l cylinders
- Automatic and electric actuation
- Stand alone system
- Low refilling costs

Products – Pump Systems



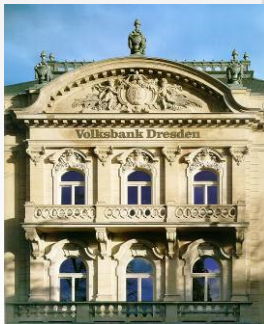
- **Compact design**
- **120 / 140 bar pressure**
- **50 / 98 / 120 l/min pumps**
- **Immediate re-operation after actuation**
- **High reliability**
- **Small break tank sizes**

Applications



- Company
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- **Applications**

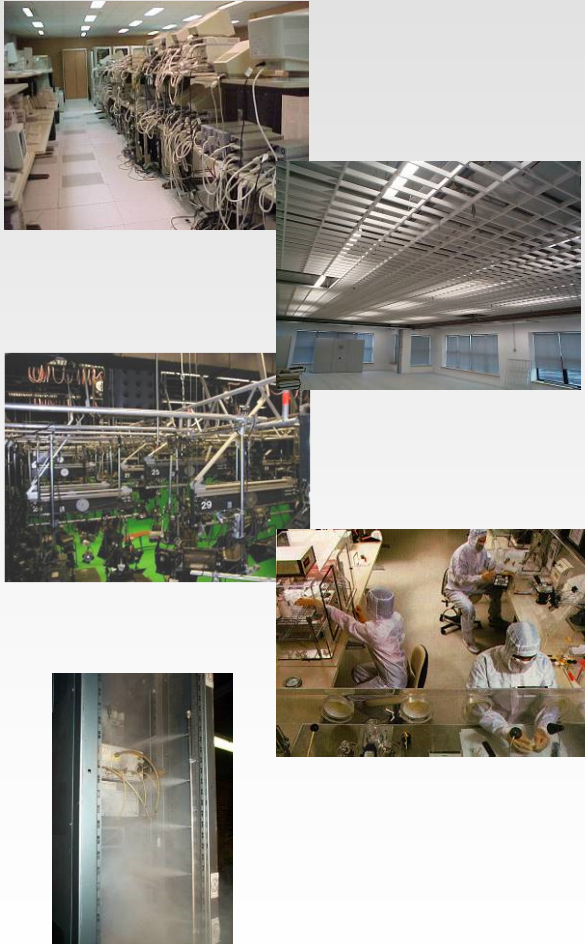
Applications – Key Applications



Offices / Archives / Museums

- Minimal water damage
 - Safe environment / High cooling effect
 - Easy retrofit
- No water storage requirements**

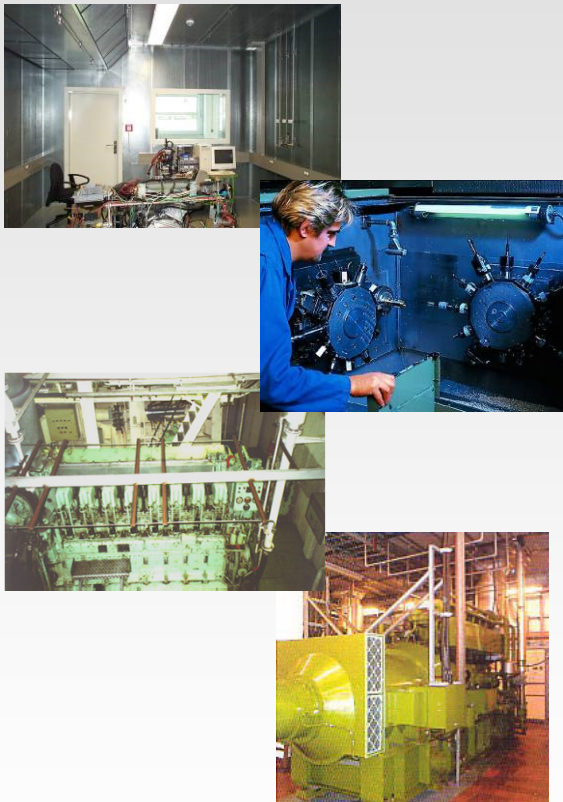
Applications – Key Applications



IT Areas / Telecommunication

- No area restrictions
- Smoke washing effect
- No structural measures required
Easy retrofit
- Optional in-cabinet protection

Applications – Key Applications



Industrial Applications

- Rapid extinguishment / Cooling
- Safe for operators
- Short business interruption
- Typical risk areas
 - Generators
 - Engine test cells
 - CNC machines
 - Turbines
 - Transformers

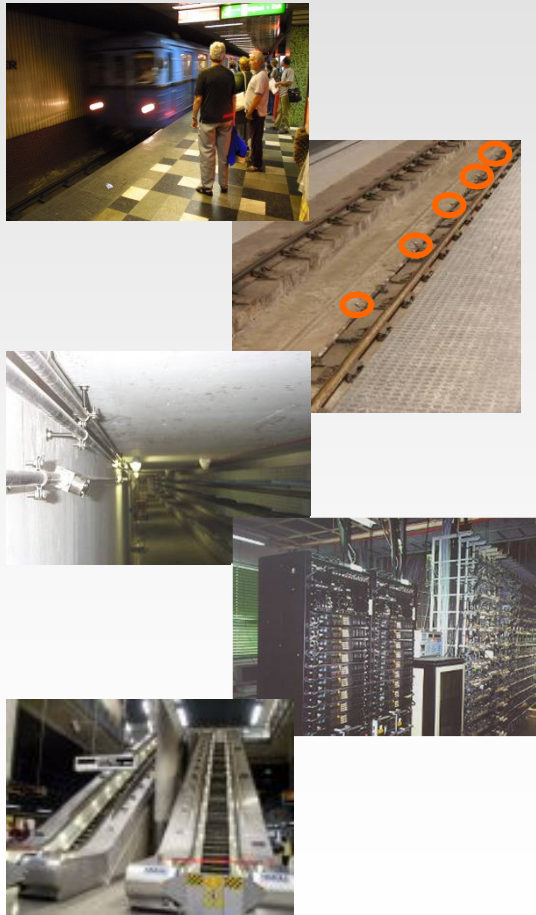
Applications – Key Applications



Cable Tunnels

- High cooling / Smoke washing effect
- Minimal water damage
- Short business interruption
- Easy installation at ceiling level

Applications – Key Applications



Underground Stations

- High cooling effect
- Partial smoke washing effect
- Short business interruptions
- Easy retrofit
Small water storage requirements
- Typical risk areas
 - Cable tunnels
 - Escalators
 - Platforms
 - Machinery Rooms

Applications – Key Applications



Mobile Systems

- Industrial or fire brigade use
- Rapid intervention units
- Effective for small fires
- Various options

Applications – Reference Projects



Training Building of Heidelberger Druckmaschinen AG (Germany)

- Protection of the entire office building including the 44 m high atrium
- The water mist system compensates missing structural fire protection measures
- 2800 nozzles

Applications – Reference Projects



Clock Tower in Mekka (Saudi Arabia)

- Protection of the 2nd tallest building in the world (600 m)
- Protected areas are an astronomical museum, prayer areas and technical areas
- 2700 nozzles, 83 high pressure wall hydrants

Applications – Reference Projects



Castle Museum in Moers (Germany)

- Protection of the entire museum and the integrated theatre
- Integration of the pipes and nozzles into the heritage structure of the building
- 200 nozzles

Applications – Reference Projects



La Fenice Theatre in Venice (Italy)

- Protection of the attic above the theatre hall
- Minimal water usage to protect the ancient ceiling of the theatre hall
- 220 nozzles

Applications – Reference Projects



Town Hall Cibeles in Madrid (Spain)

- Protection of the entire heritage building
- 1300 nozzles

Applications – Reference Projects



Elbphilharmonie in Hamburg (Germany)

- Protection of the concert hall
- Special fire protection concept with floor mounted nozzles
- 400 nozzles



Applications – Reference Projects



Library in Trier (Germany)

- Protection of the entire library building
- 750.000 books from the last 1200 years with a total value of ca. 250 Mio. Euro
- 600 nozzles, 4 section valves, 12 high pressure wall cabinets

Applications – Reference Projects



Library in Bilbao (Spain)

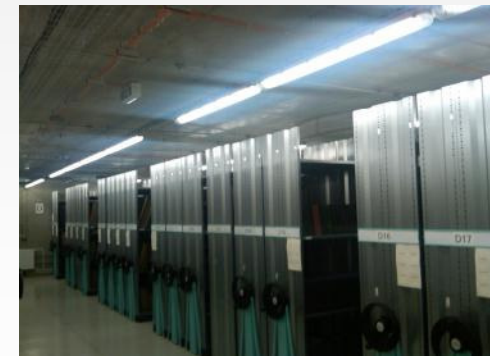
- Protection of the entire library building
- Integration of the pipes and nozzles into the heritage structure of the building
- 1200 nozzles, 10 high pressure wall cabinets

Applications – Reference Projects



Technical Library in Prague (Czech Rep.)

- Protection of the entire library building
- Special nozzle arrangement for atrium protection
- 4200 nozzles



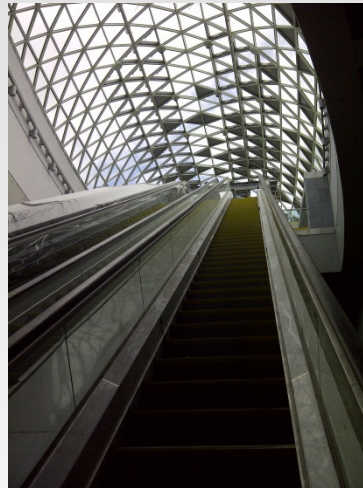
Applications – Reference Projects



EMOC National Archive in Paris (France)

- Protection of 200 archives of each 200 m² and the adjacent office building
- Specific archive fire tests have proven the efficiency of the system
- 5500 nozzles

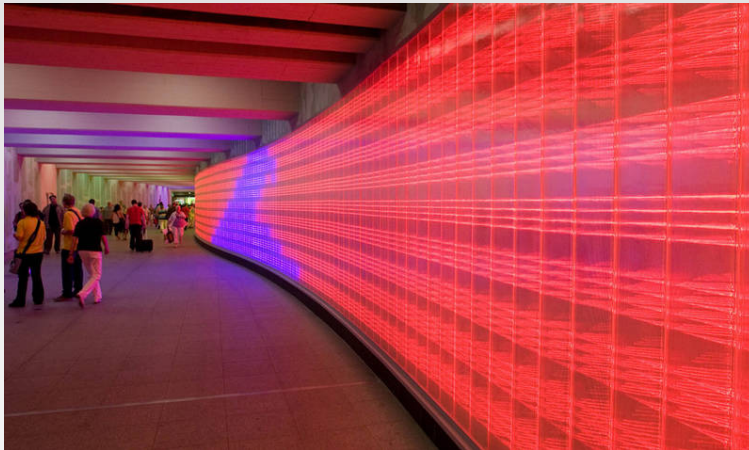
Applications – Reference Projects



Metro Linie M2 and M4 in Budapest (Hungary)

- Protection of 18 underground metro stations, the train depot and the main control tower
- In each station the platforms, escalators, cable tunnels and technical rooms have been protected
- 6200 nozzles, 230 section valves, 80 high pressure wall hydrants

Applications – Reference Projects



Main Station in Essen (Germany)

- Protection of all underground sales areas and technical rooms
- 900 nozzles

Applications – Reference Projects



Telecity in Frankfurt (Germany)

- Protection of a 6.000 m2 data center
- 750 nozzles, 12 section valves

Applications – Reference Projects



Votteler in Stuttgart (Germany)

- Protection of a production and storage facility in a paint factory
- 3 % AFFF additive
- 700 nozzles, 33 section valves

Applications – Reference Projects



Bayer Factory in Krefeld (Germany)

- Protection of the entire power distribution network of the factory
- 550 nozzles, 17 section valves

Applications – Reference Projects



Main Train Station in Cologne (Germany)

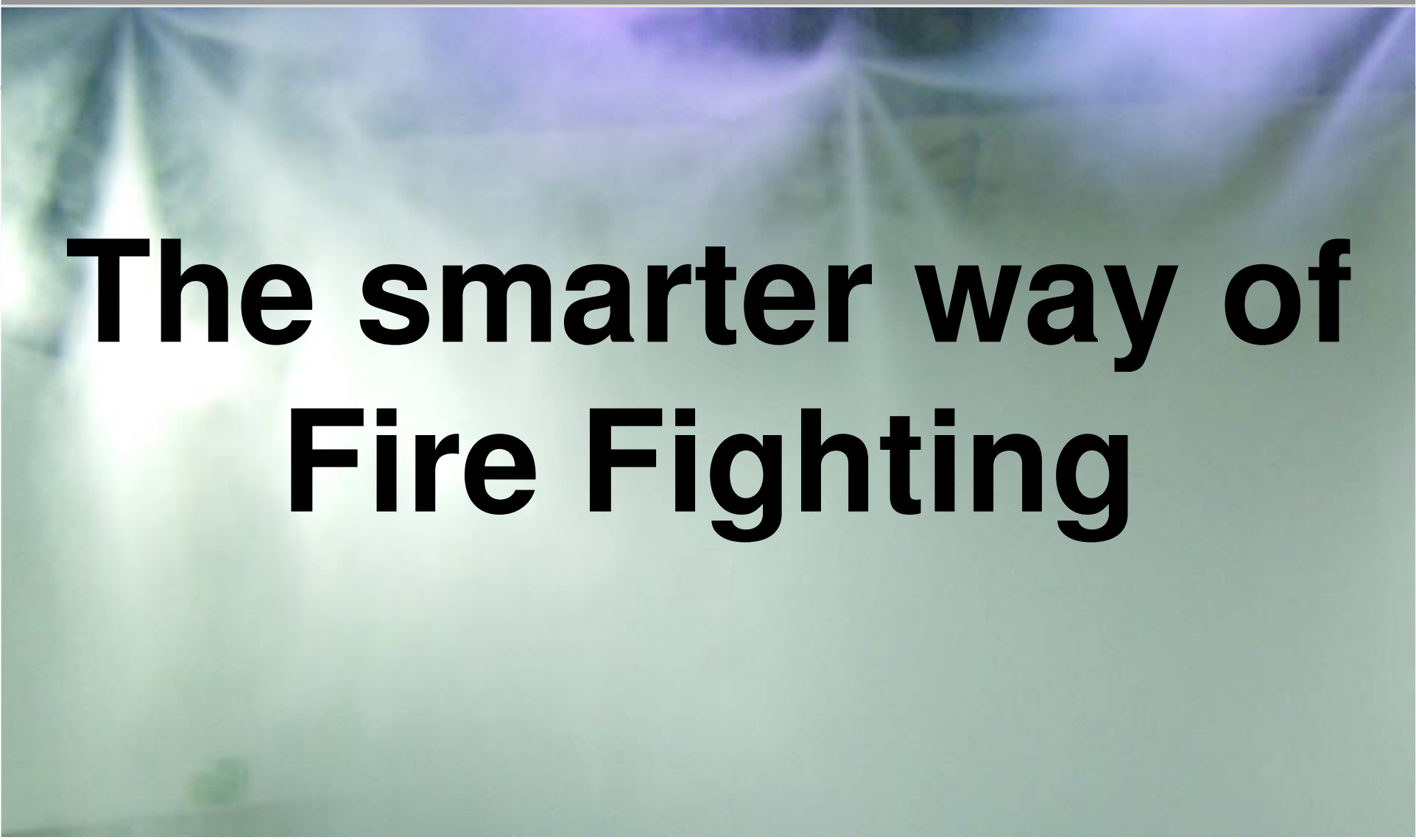
- Protection of the entire cable tunnel network under the train station
- 400 nozzles, 20 section valves

Applications – Reference Projects



Chongming Cable Tunnel in Shanghai (China)

- Protection of 15 km long power supply cable tunnel to the Chongming island
- 5300 nozzles, 460 section valves



The smarter way of Fire Fighting