



HIGH PRESSURE WATER MIST SYSTEM

Application: High Rise Building

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- **Hotel & Apartment**
- **Office & Walkways**
- **Shopping mall & Lobbies**
- **Parking garage**



- No injuries
- The blaze reached several floors but was quickly extinguished
- Cause under investigation => There's a suggestion the fire started on the roof of the Mandarin, where they have been carrying out building work.



- Earlier fire already in 2015
- Cigarette caused Dubai's Torch tower fire / Butt thrown from balcony landed on plant pots, sparking blaze
- 15th floor
- 79 floor building / one of the tallest residential building in the world
- No injuries / 676 apartments



Source: <https://eu.usatoday.com>

- **Malfunctioning Fridge-freezer on the fourth floor**
- **Rapid spread of fire – attributed to the buildings exterior cladding**
- **Burned about 60 hours**
- **72 deaths, over 70 injured**
- **223 people escaped**



Source: https://en.wikipedia.org/wiki/Grenfell_Tower_fire

Risk and challenges

- **Fast smoke radiation inside the building...**
...causes also hard conditions for rescuer
- **Danger of rapid fire spread...**
... often too fast for the fire brigade
- **Complex evacuation scenarios...**
...especially in heights, where it is not possible to evacuate with ladders



How can high pressure water mist meet these challenges?!?

Water mist systems

- **High Pressure Water Mist systems...**
...for OH- and technical areas
- **Quick activation and Protection...**
... of bordering levels and rooms
- **Approved by independent institutes...**
... based on common EU standards



Benefits of water mist

- **Lower Water consumption than conventional sprinklers**
... enables smaller water reservoirs, pipes and valves
- **3d-effect of water mist...**
...for reaching corners and hidden fires
- **Individual system approval...**
... based full scale fire tests



System design possibilities

- **System types**

- ...wet system

- ...dry system

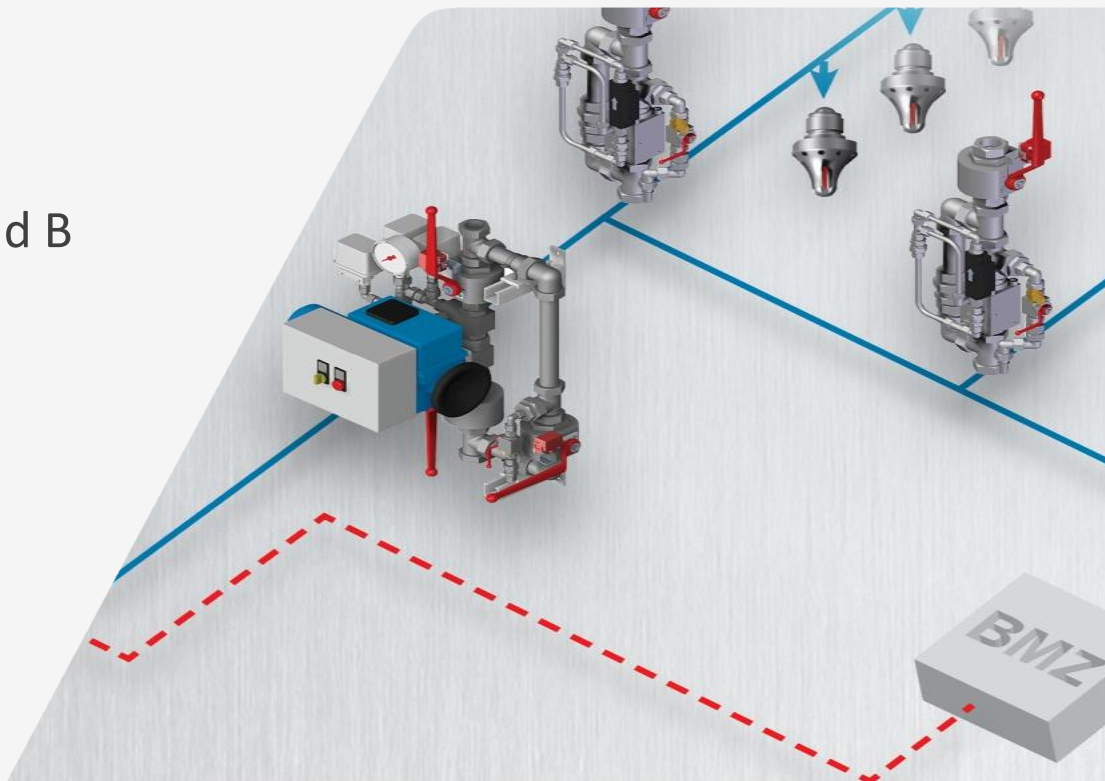
- ...pre-action system type A and B

- **Supply stations**

- ... electrical power pack

- ... Diesel power pack

- ... battery-back up systems



Water reservoirs

- Possibility for Full or partial storage
- Site installation possible
- Easy for retrofit installations



Compact Valve station

- **Alarm valve...**
... for interacting with the central fire alarm system
- **Flow Switch...**
... for fire brigade and fire protecting officer, to show in which floor the fire occurred
- **Diverter valves.....**
.....for deluge applications



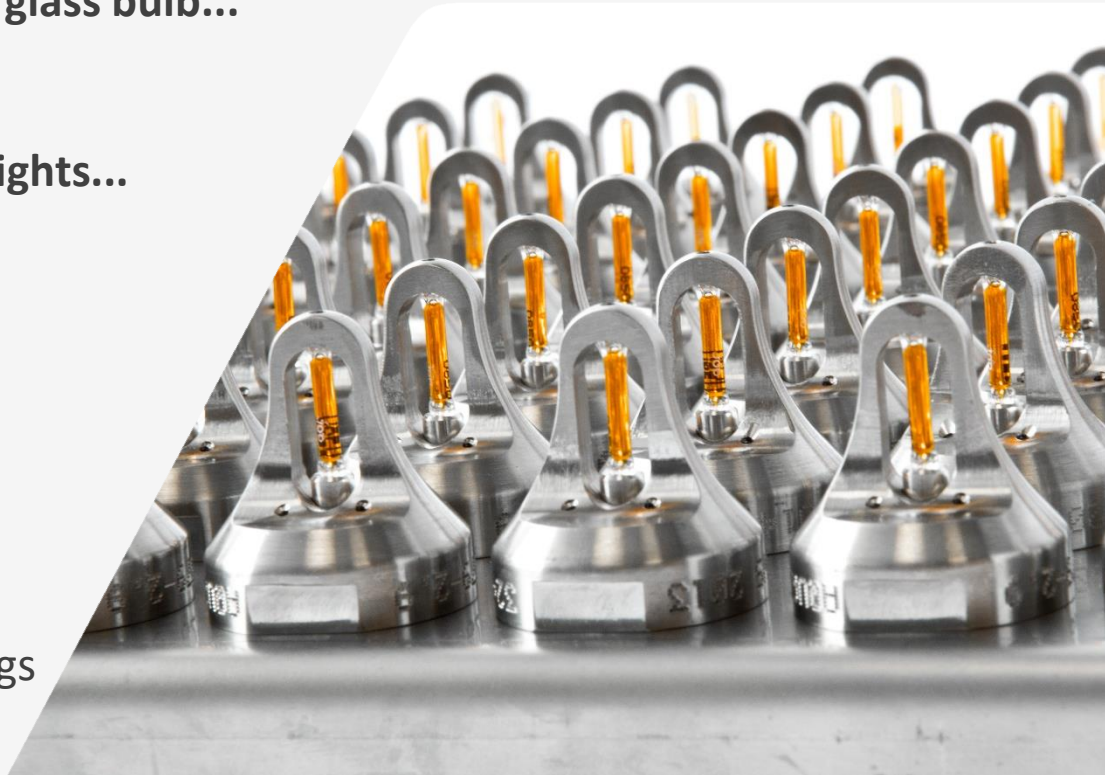
Flexible Piping

- **Reduced pipe dimensions of 12L - 42L...**
...for riser, main line and nozzle piping
- **Stainless Steel pipe AISI 316L...**
...for longer lifetime
- **Pressure level...**
... PN160 (160bar)
- **All connections ...**
... according EN ISO 8434-1



Nozzles head - design

- **Nozzle head with heat-sensitive glass bulb...**
- **DKF nozzles up to 12m room heights...**
- **Sidewall nozzles...**
- **Upright nozzles...**
... for false ceiling protection
- **Stainless Steel AISI 316L...**
...for nozzles, adapters and fittings



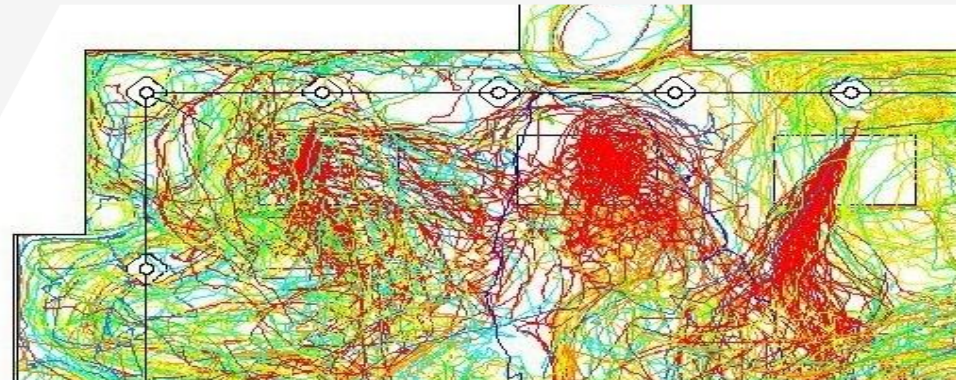
Wall hydrants

- Fire tests in accordance to the standards of wall hydrants EN671, fire load according EN3
- Easy handling
- Up to 80m of hose length possible
- Up to 4 different spraying patterns



Fire tests and CFD's simulation

- **Real scale fire tests...**
... according common standards as well as customer requirements
- **Proof and confirmation...**
... of the excellent performance of AQUASYS high pressure water mist
- **Flexible test area...**
... for fast test setup and test execution



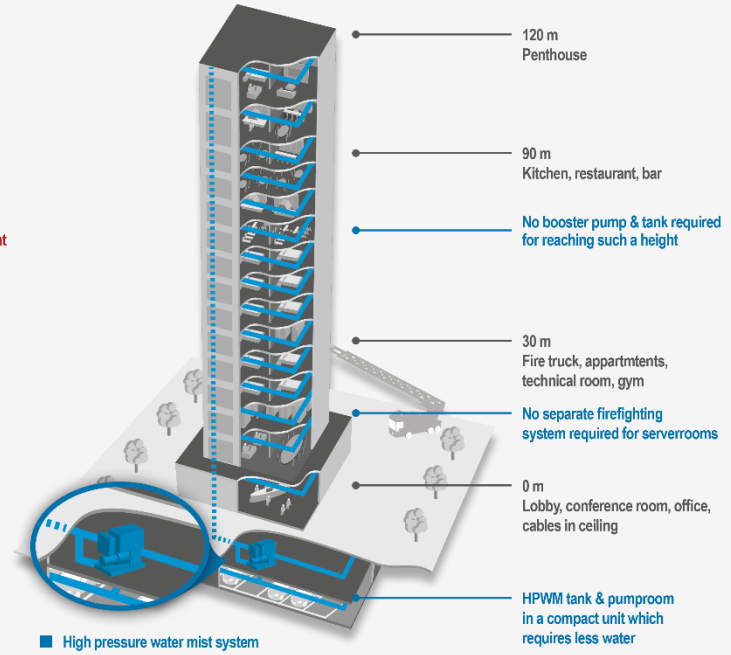
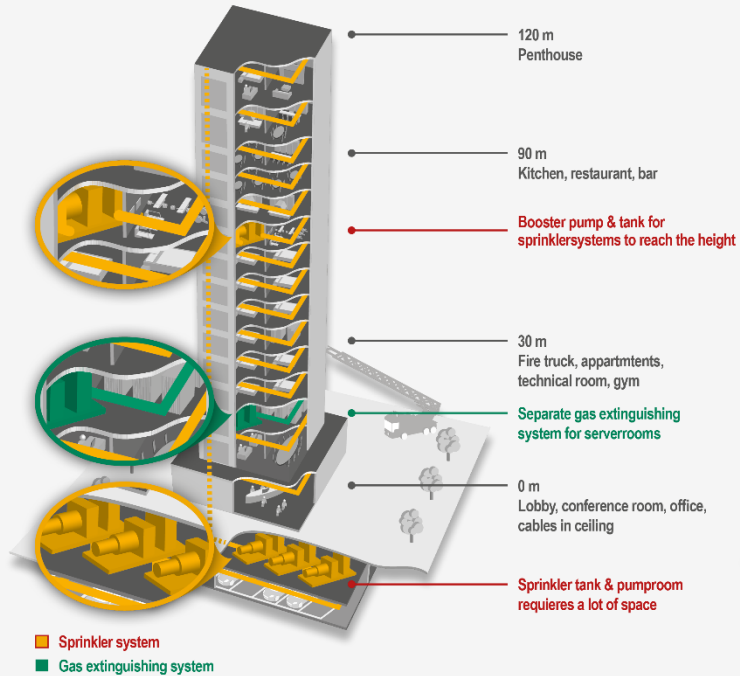
Research partners

Research-Partners



Memberships / Working Groups





References

Maakri 19/21 Tower, Tallinn (Estonia)
AQUASYS fire-fighting system for 30-storey skyscraper in the centre of Tallinn.

- Protection of office areas, technical areas and car parks in the skyscraper in Tallinn's Maakri Kvartal district
- Installation and project management by local partner
- 2464 nozzle heads and 11,623 m of pipeline installed in total
- Building height 110 m



Dreischeibenhaus, Düsseldorf (Germany)

AQUASYS high-pressure water mist for protecting high-rise building in Düsseldorf.

- Installation of a water mist system on the second basement floor during general renovations
- Protection of the exhibition areas on the 21st, 22nd and 23rd floors at a height of approximately 70 m
- Project execution and installation by local partner



Shopping Mall, Taipei (Taiwan)

High-pressure water mist system for the shopping mall.

- Protection of the atrium and emergency escape routes in the 16-floor shopping centre
- Water mist offers ideal protection against spreading flames to other areas, due to its excellent cooling properties



High-rise office building, Frankfurt (Germany)

Water mist replacing sprinklers for modernisation of a high-rise building in Frankfurt.

- Surface area of 30,000 m² protected across 25 floors
- Protection of offices, equipment rooms and an atrium over three floors
- Installation performed only at weekends to avoid interrupting operations
- Only one pump room required to supply the entire 96-metre-high building



***Protection of health, life
and property means:
“Firefighting is
responsibility”***

