



# Watermist - Building protection in accordance with EN14972 and other guidelines (VdS 3883-5) AquaMist

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## Agenda

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- EN14972 part 1
  - Design, Installation, Inspection and Maintenance
- Overview EN14972 part 2-17
  - Fire test protocols
- Typical BUILDING PROTECTION areas according to EN14972
- Project Application: OH3 fire testing to VdS 3883 Part 5:2020
  - Low pressure watermist system
  - Shopping/Sales Areas, Libraries, Archives, Technical Rooms, Storage areas and comparable risks
- Conclusion

## EN14972 part 1

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- This standard specifies requirements and gives recommendations for the design, installation, inspection and maintenance of all types of fixed land-based water mist systems.
- Water mist systems shall be designed for specific hazards or occupancies covered by EN 14972 series fire test protocols and in accordance with information and limitations obtained from these fire test protocols and the manufacturers DIOM manual

## EN14972 fire test protocols part 2-17

EN 14972 consists of the following parts:		based on	status november 2022
EN 14972 part 1	Design, Installation, inspection and Maintenance		published
EN 14972 part 2	Shopping and sales areas	VdS	taks group started
EN 14972 part 3	Office, school and hotel	VdS	published
EN 14972 part 4	Non storage occupancies	FM5560	Enquiry
EN 14972 part 5	Car garage	VdS	Enquiry
EN 14972 part 6	False floor and ceiling	VdS	Formal Vote
EN 14972 part 7	Commercial low hazard occupancies	BS8489	comments received tbd
EN 14972 part 8	Machinery enclosures>260m <sup>3</sup>	FM5560	published
EN 14972 part 9	Machinery enclosures<260m <sup>3</sup>	FM5560	published
EN 14972 part 10	Atrium	DFL	published
EN 14972 part 11	Cable tunnels	VdS	Formal Vote
EN 14972 part 12	Commercial deep fat fryers	ISO	Enquiry
EN 14972 part 13	Wet benches and similar processing equipment	FM5560	task group formed
EN 14972 part 14	Combustion turbine enclosures>260m <sup>3</sup>	FM5560	published
EN 14972 part 15	Combustion turbine enclosures<260m <sup>3</sup>	FM5560	published
EN 14972 part 16	Industrial Oil cookers	FM5560	published
EN 14972 part 17	Residential and domestic occupancies	BS8458	comments received tbd

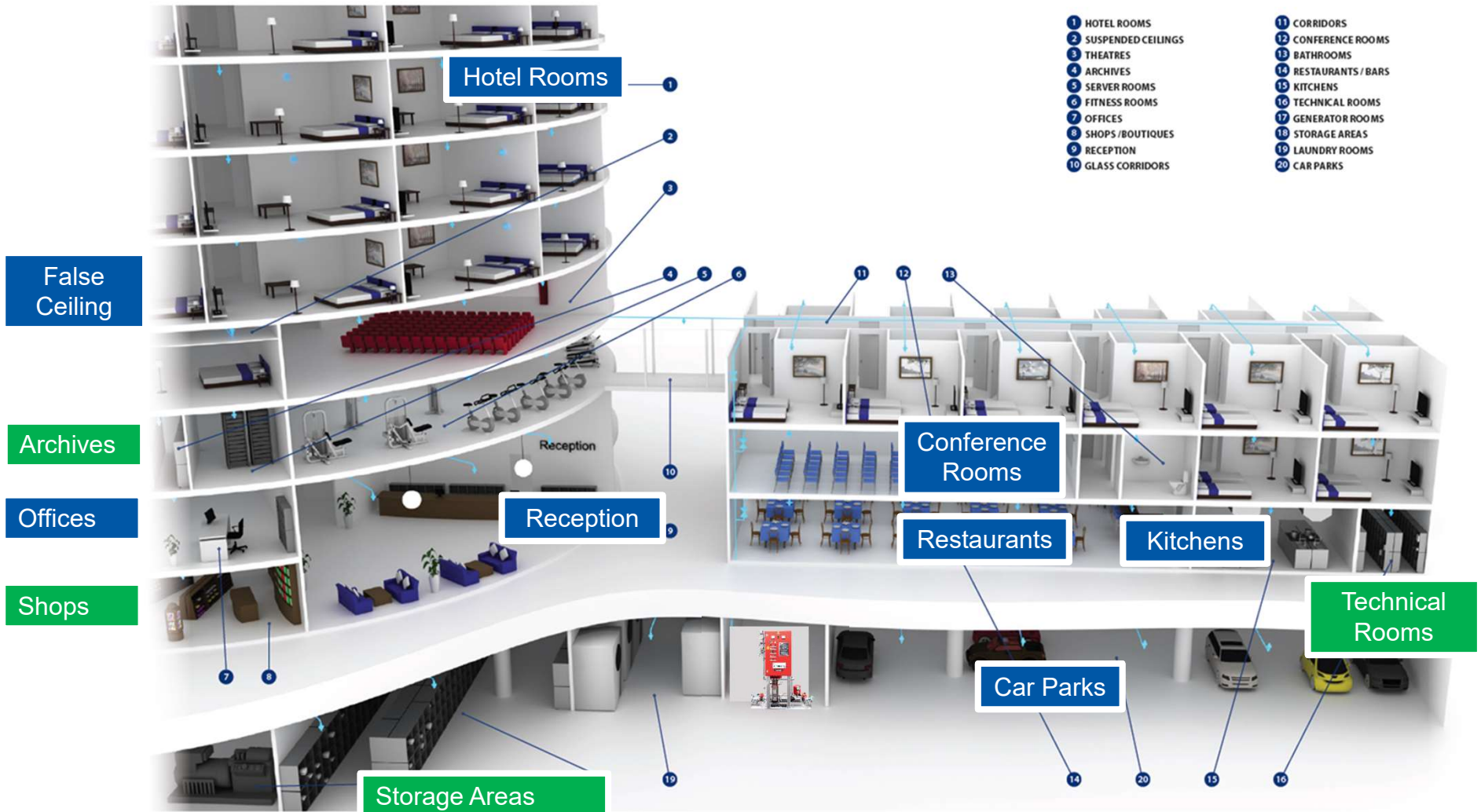


EN 17450 part 1-X: Requirements for watermist components such as nozzles, valves, filters/strainers, pumps



# Watermist Systems:

## Typical *BUILDING PROTECTION* areas according to EN14972



# Watermist Systems:

## Typical *BUILDING PROTECTION* areas according to EN14972



EN 14972 part 2	Shopping and sales areas	Shops, Archives, Technical Rooms, Storage areas	VdS 3883-5
EN 14972 part 3	Office, school and hotel	Hotel Rooms, Offices, Reception, Conference Rooms, Restaurants, Kitchens	VdS 3883-1 and 2
EN 14972 part 4	Non storage occupancies		FM5560
EN 14972 part 5	Car garage	Car Parks	VdS 3883-4
EN 14972 part 6	False floor and ceiling	False Ceiling	VdS 3883-3
EN 14972 part 7	Commercial low hazard occupancies		BS8489
EN 14972 part 8	Machinery enclosures >260m <sup>3</sup>		FM5560
EN 14972 part 9	Machinery enclosures <260m <sup>3</sup>		FM5560
EN 14972 part 10	Atrium		DFL
EN 14972 part 11	Cable tunnels		VdS
EN 14972 part 12	Commercial deep fat fryers		ISO
EN 14972 part 13	Wet benches and similar processing equipment		FM5560
EN 14972 part 14	Combustion turbine enclosures >260m <sup>3</sup>		FM5560
EN 14972 part 15	Combustion turbine enclosures <260m <sup>3</sup>		FM5560
EN 14972 part 16	Industrial Oil cookers		FM5560
EN 14972 part 17	Residential and domestic occupancies		BS8458



## VdS 3883 - Fire Test Protocol for Water Mist Systems

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<b>Part 1</b>	Protection of office spaces and accommodation areas
<b>Part 2</b>	Protection of Office Spaces and Accommodation Areas with Water Mist Sidewall Sprinklers
<b>Part 3</b>	Protection of False Ceilings and False Floor of OH Group 1
<b>Part 4</b>	Protection of car garages
<b>Part 5</b>	Protection of selected sales and storage areas and mechanical floors
<b>Part 6</b>	Protection of Paint Booths
<b>Part 7</b>	Protection of Areas with Combustible Liquids
<b>Part 8</b>	Protection of Cable Ducts

# OH3 fire testing to VdS 3883 Part 5:2020

- Ceiling mounted water mist sprinklers to be used in *unlimited volumes/areas*
- Ceilings with heights of 2.6m and above to max tested ceiling heights
- Shopping/Sales Areas, Libraries, Archives, Technical Rooms, Storage areas and comparable risks
- **Reference testing** with a prescribed sprinkler system to indicate baseline testing

Shops

Archives

Technical Rooms

Storage Areas

- EN14972 part 2 (in future based on VdS)
- Typical known as OH3 applications

VdS	VdS Guidelines for Water Mist Systems	VdS 3883-5en
<p><b>Fire Test Protocol for Water Mist Systems</b></p> <p><b>Part 5: Protection of selected sales and storage areas and mechanical floors</b></p>		



# OH3 fire testing to VdS 3883 Part 5:2020

## Pass Fail Criteria:

- Total **averaged damage** of Watermist test is less than or equal to total **averaged damage** of sprinkler test series
- Total **averaged ceiling** gas temperatures of Watermist test is less than or equal to total **averaged ceiling** gas temperatures of sprinkler test series
- Max allowed total no. activated and allowed no. activated in outer ring as specified

Shops

Archives

Technical  
Rooms

Storage Areas

- EN14972 part 2 (in future based on VdS)
- Typical known as OH3 applications

VdS	VdS Guidelines for Water Mist Systems	VdS 3883-5en
<p><b>Fire Test Protocol for Water Mist Systems</b></p> <p><b>Part 5: Protection of selected sales and storage areas and mechanical floors</b></p>		

# OH3 fire testing to VdS 3883 Part 5:2020

- 2 different test scenarios: Rack Storage and Block Storage

## Rack Storage

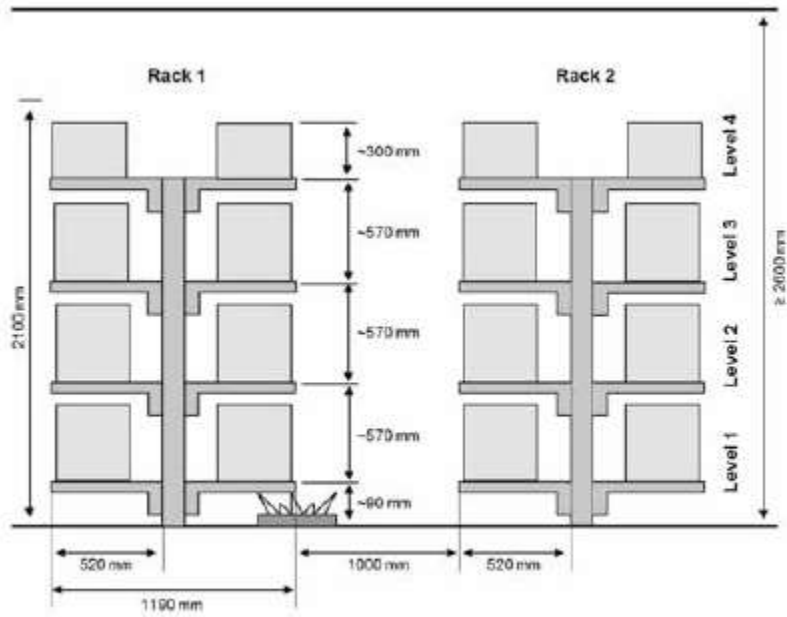


Figure 4-1: Layout of fire loads and position of ignition source for rack storage (side view)

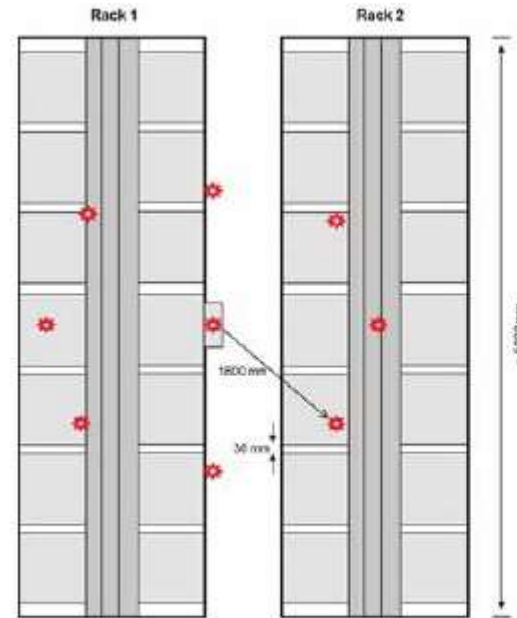


Figure 4-2: Layout of fire loads and position of ignition source for rack storage (top view)

# OH3 fire testing to VdS 3883 Part 5:2020

- 2 different test scenarios: Rack Storage and Block Storage

## Block Storage

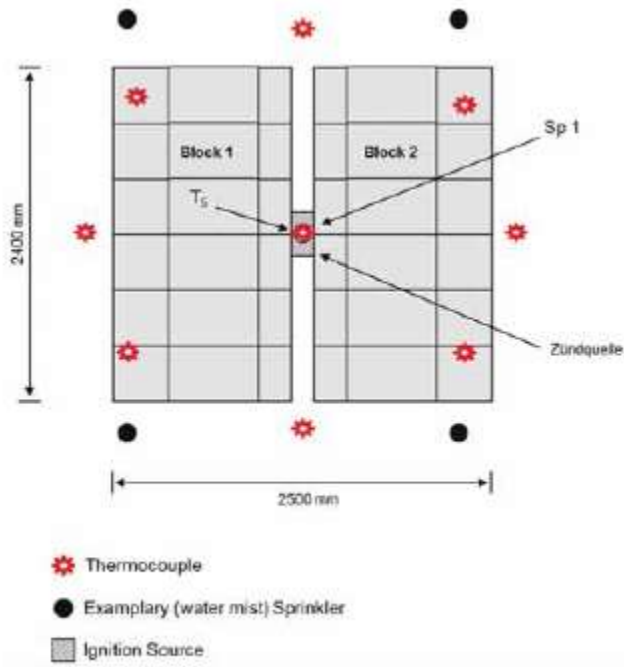


Figure 4-3: Layout of fire loads and position of ignition source for block storage (top view)

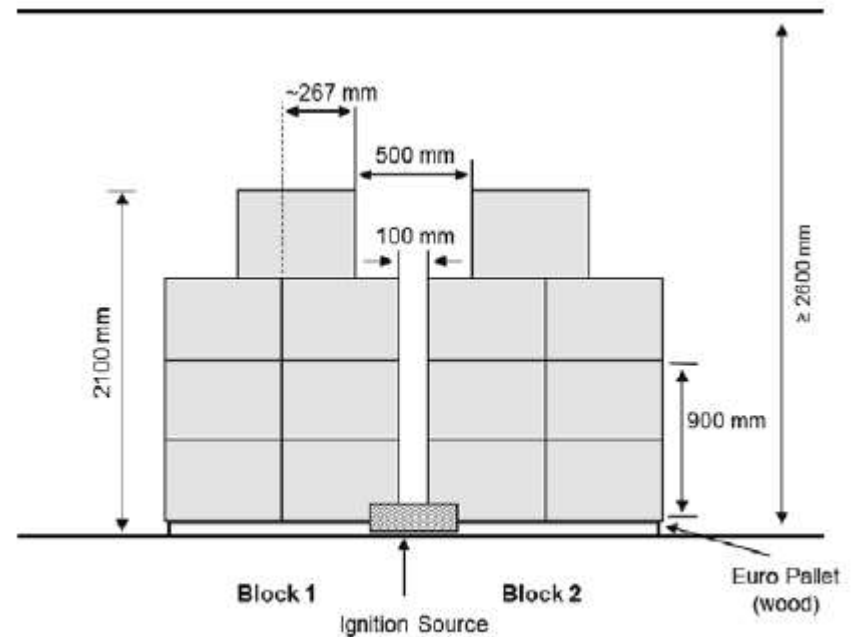


Figure 4-4: Layout of fire loads and position of ignition source for block storage (side view)

# OH3 fire testing to VdS 3883 Part 5:2020

- Fire loads: Cardboard boxes + plastic cups

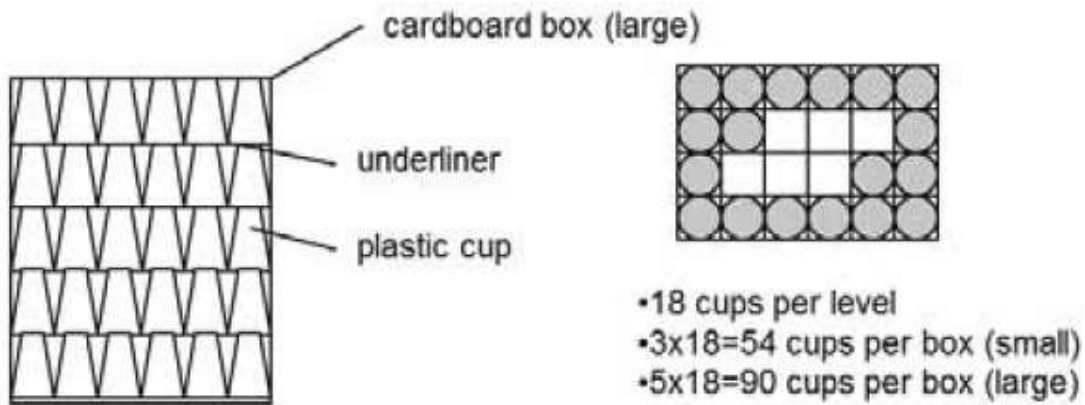


Figure 4-5: Packaging scheme of cups in the cardboard box



Figure 4-6: Prepared cardboard box



## OH3 fire testing to VdS 3883 Part 5:2020

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- 4 test scenarios (for sprinkler baseline + Watermist test series)

### Rack Storage

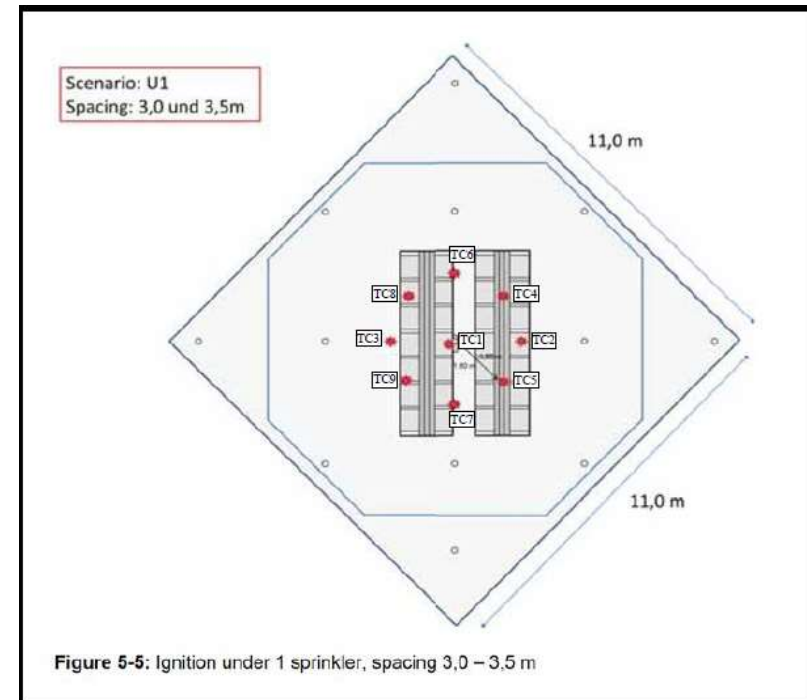
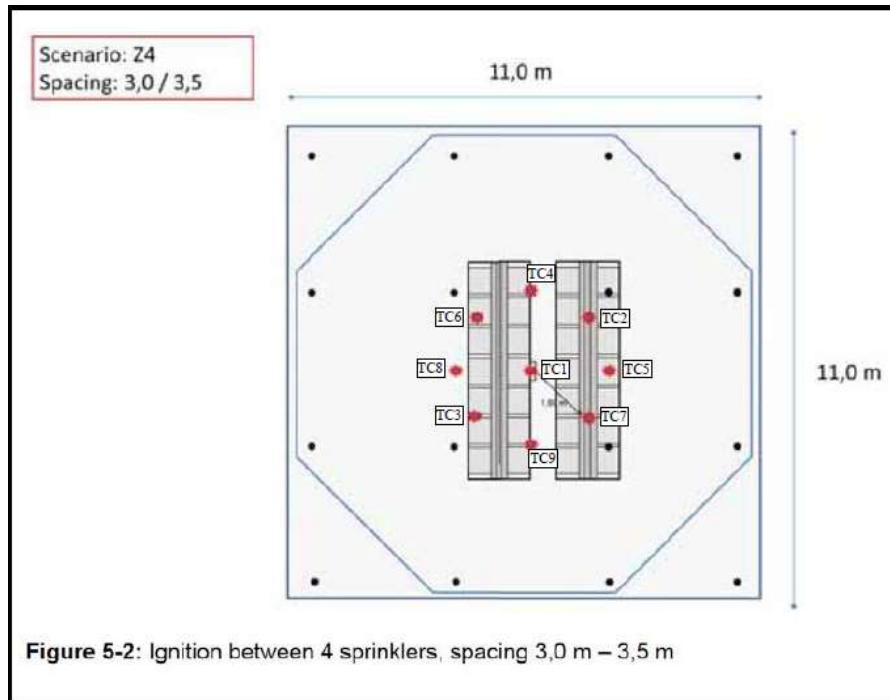
- Ignition under 1 sprinkler/nozzle (U1 Rack)
- Ignition between 4 sprinklers/nozzles (B4 Rack)

### Block Storage

- Ignition under 1 sprinkler/nozzle (U1 Block)
- Ignition between 4 sprinklers/nozzles (B4 Block)

## OH3 fire testing to VdS 3883 Part 5:2020

- Watermist test series (for block storage configuration same sprinkler grids are used)
- Max activated nozzles in outer ring ( $9\text{m}^2 \rightarrow 12 \rightarrow 3$ )
- ***Unlimited volumes/areas***



## OH3 fire testing to VdS 3883 Part 5:2020

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- WM B4 Block



## OH3 fire testing to VdS 3883 Part 5:2020

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- WM U1 Block





## OH3 fire testing to VdS 3883 Part 5:2020

- WM U1 Rack



## OH3 fire testing to VdS 3883 Part 5:2020

- WM U4 Rack



# Conclusion

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- In general, it can be concluded that for the protection of Buildings Watermist systems, having executed the fire test protocols of the EN14972 parts 2-17 or equivalent test protocols like VdS 3883, FM5560, DFL etc, planned in accordance with 14972-1 and having validated/proofed components in their systems (laboratory component test passed) are a valuable and economic alternative for sprinkler systems.
- Watermist system enhanced cooling capabilities compared to sprinkler systems (40-50% lower temp).
- Watermist Systems can provide the same safety and performance level by using 40-50% less water compared to a conventional sprinkler system to protect buildings.

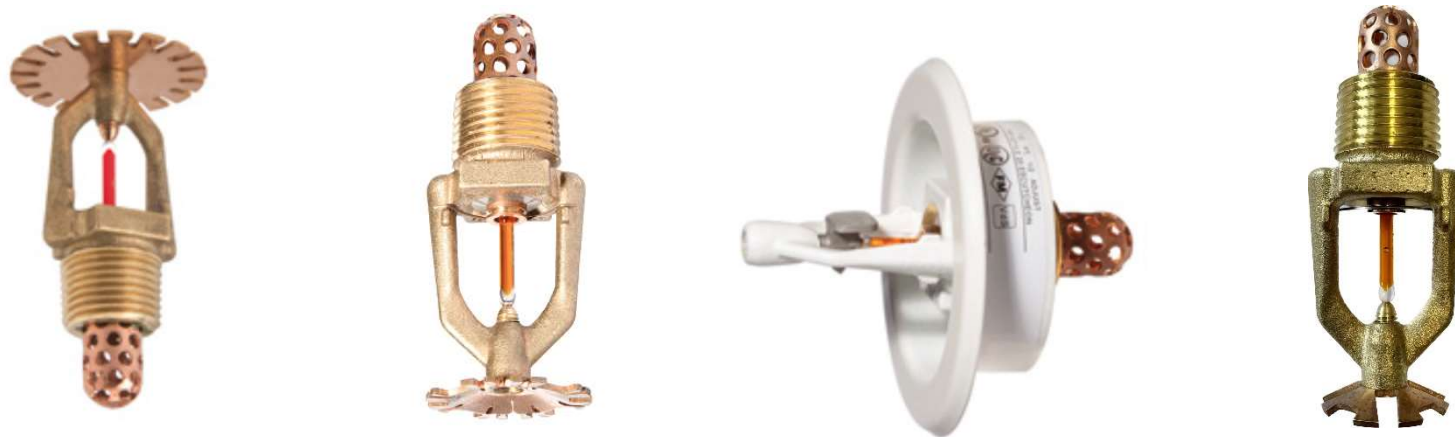


## Watermist - Building protection in accordance with EN14972 and other guidelines (VdS 3883-5)

# Questions?

# Thank you!

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