

High Pressure Water Mist for Laboratories and High Sensitive Areas



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firefighting is responsibility

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- △ Typical Applications
- △ Requirements (Customer, Consultants, System Integrator)
- △ Technology Comparison
- △ Specific Requirements Project Execution
- △ Case Study Full Scale Fire Test

Typical applications

- △ Laboratories
- △ High sensitive test benches
- △ Clean Rooms
- △ Semi conductor production lines
- △ Chemical plants
- △ Server Rooms
- △ Electrical Rooms



- △ System with immediate effect and immediate return to service after an activation
- △ Reducing of contamination by smoke
- △ Avoiding of contamination by extinguishing agent
- △ “Small size” retention area for fire water



Risk and Challenges







- ▲ Risk of fast spreading of fire caused by flammable solids, liquids, cables...
- ▲ Several potential fire sources in working process
- ▲ Risk of loosing infrastructure and products
- ▲ Risk of loosing availability of infrastructure and productivity (downtime costs)



Requirements

- △ Applicable test reports for varying fire loads
- △ Knowledge in handling different surrounding conditions (cold, hot, aggressive, ...)
- △ Knowledge of production / working process to ensure adequate design to reach protection target
- △ Experienced installation team not to influence daily working process and productivity of sensitive area during installation



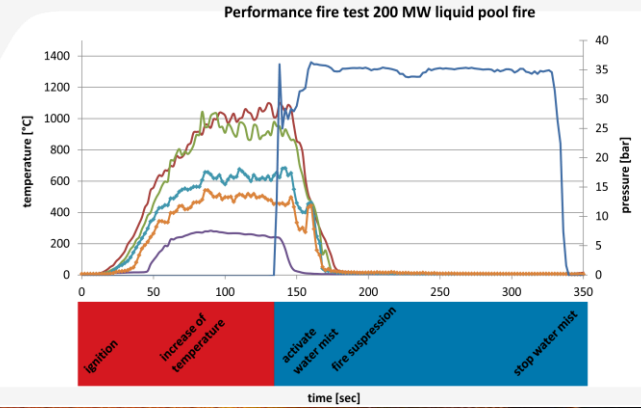
Standard HPWM application	Special attention for
flammable liquids and gases   	metal fires or other fire loads reacting with water. 
Solids like insulations, plastics, rubber, cables, powder, food, ... 	Protection of areas containing chemical agents reacting with water
Surrounding: Ventilation, high voltage, ...	High voltage equipment has to be considered case by case 
Intervention: Manual, availability of fire brigade, ..	Intervention time according regulations sufficient?

Available Technologies

	Conventional Gas System	Conventional Sprinkler System	High Pressure Water Mist
costs	(+)	(+/-)	(-)
Risk for humans and environment	(+/-) depending on gas type	(+/-)	(+)
Risk of damaging highly sensitive equipment	(+)	(-) high amount of water	(+)/(-)
Immediate reaction	(+/-) after evacuation time	(+)	(+) harmless to human
Costs for return to operation after activation	(-) all gas bottles to be changed	(-) Removal of contaminated water	(+)
Time for return to service after activation	(-)	(-) huge water tank	(+) only small water tank to be refilled
Maintenance costs	(-)	(+/-) lifetime	(+) Cheap, investment pays off on longer term
Economical for large facilities	(-)	(+/-)	(+) easy extensions possible

Highest efficiency

- △ 3-dimensional extinguishing effect
- △ Continuous cooling, reaching hidden areas and protection of equipment around fire zone
- △ Cleaning effect of flue gases and smoke
- △ Minimal influence on electrical and electronic components



Harmless to humans

- △ Drinking water as suppression agent
- △ Water mist supports development of viable surrounding conditions
- △ Immediate activation without warning time and no danger to service staff
- △ No significant change of the evacuation time



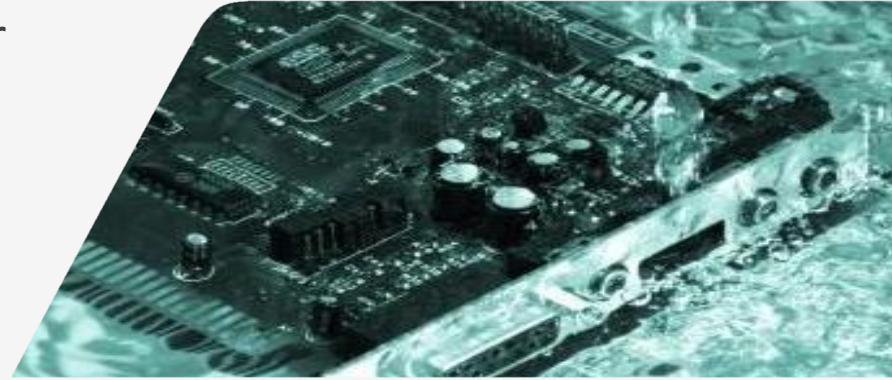
Excellent functionality

- ▲ Compact design and long lifetime
- ▲ Reduced pipe dimensions usually between DN10 and DN20 for nozzle lines and DN25 to DN32 for main lines
- ▲ Easy structural integration and retro fit installation
- ▲ Stainless Steel AISI 316L for piping, nozzles and fittings for pressure level 160bar



Minimal Water consumption

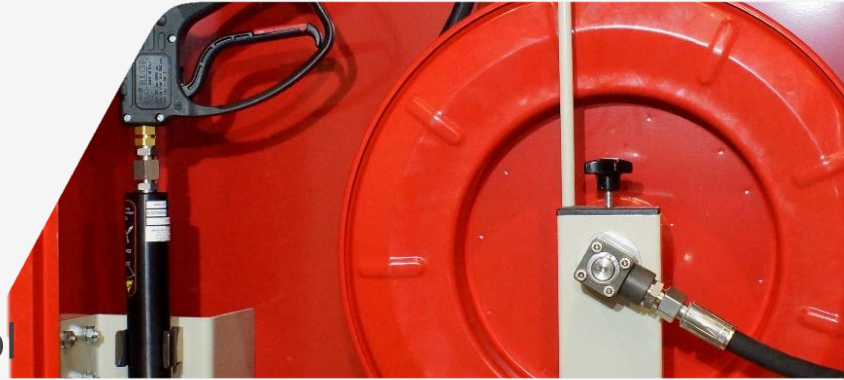
- △ Reduced risk of contamination and water damaged
- △ less water required:
 - ... 5 ltr/m² of sprinkler system
 - ... versus 1,2-1,9 ltr/m² for Water Mist system
- △ Use of demineralized or purified water possible (no conductivity, no pollution)



Add on solutions

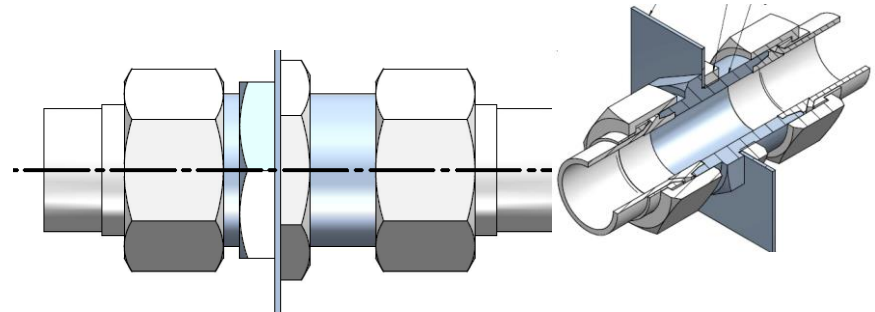
Initial fire fighting tool for service staff and workers in factory areas

- ▲ For stand alone solution or integrated into existing suppression systems
- ▲ High pressure hose reel with 20-50m length and Water Mist Gun with 20-30l/min jet tool



Bulk head connectors

- ▲ For fast and easy integration into wall breakthroughs



Conclusion 1

High sensitive areas require flexible and efficient fire fighting systems

- ▲ High efficiency:
 - handling of complex fire scenarios
 - handling of wide range of different fire loads
 - immediate activation after detection
- ▲ Less risk for equipment and infrastructure even in case of false alarm
- ▲ Using minimum water amount:
 - less risk of water damages
 - minimized amount of contaminated suppression water



Conclusion 2

High sensitive areas require flexible and efficient fire fighting systems

- ▲ Easy recommissioning
 - within short time
 - small (no) costs for any refilling, ...
- ▲ Harmless to humans and environment!!!

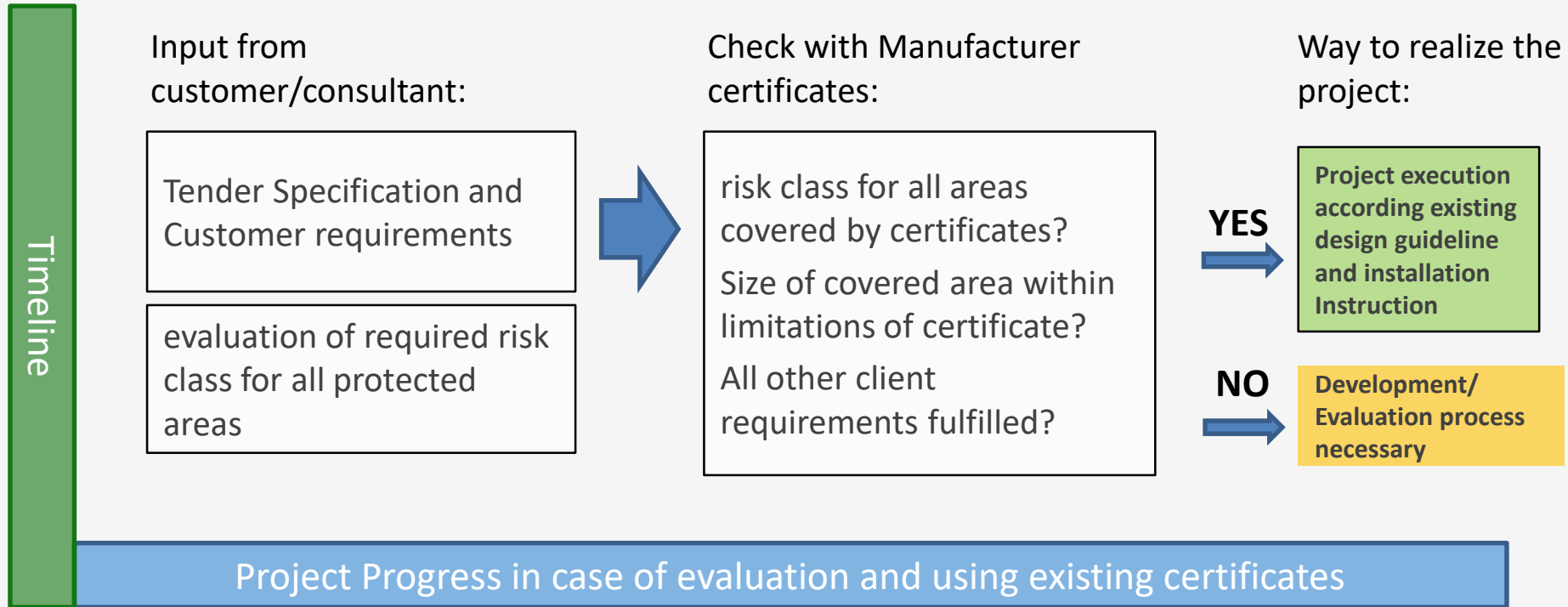
Reduced risk for operators and employees and increased system availability



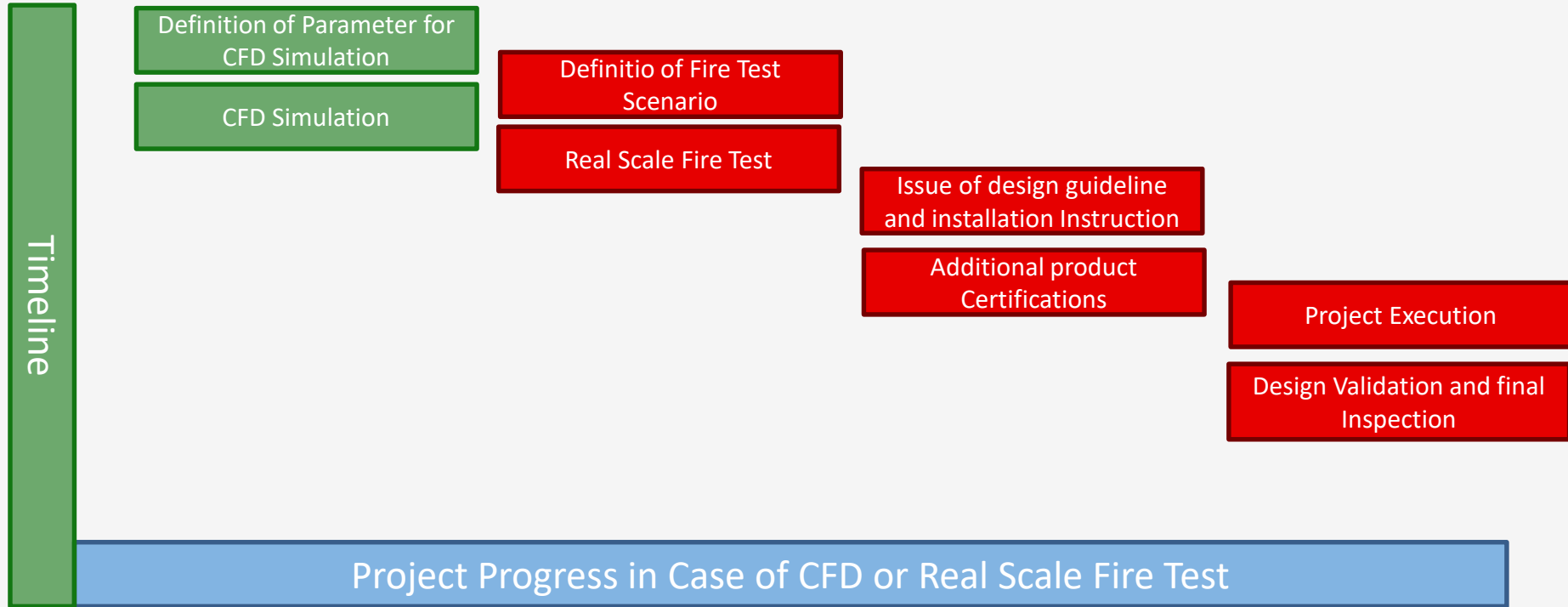


project realization

Realization process



R&D Certification Process





case study fire test

Case study: Fire test

Research target

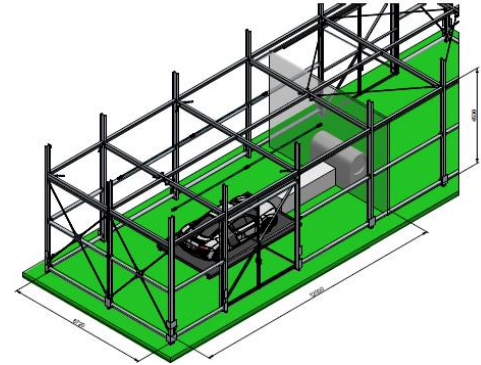
- △ Verification of a water mist system for “R&D test benches”

Protection objectives

- △ Safety for operators of test bench
- △ Monitoring of Surrounding conditions
- △ Optimization of Detection System

...in detail

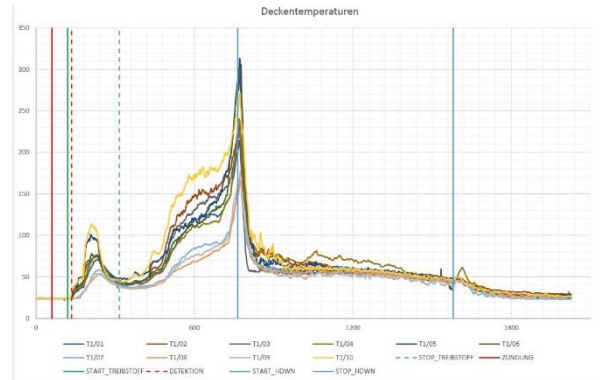
- △ Preparation of a comprehensive test spec
- △ Set up of full scale mock up incl. ventilation
- △ Execution of full scale fire tests
- △ Certification by accredited test laboratory



Full Scale Fire Test (free burn)

Free burn fire test

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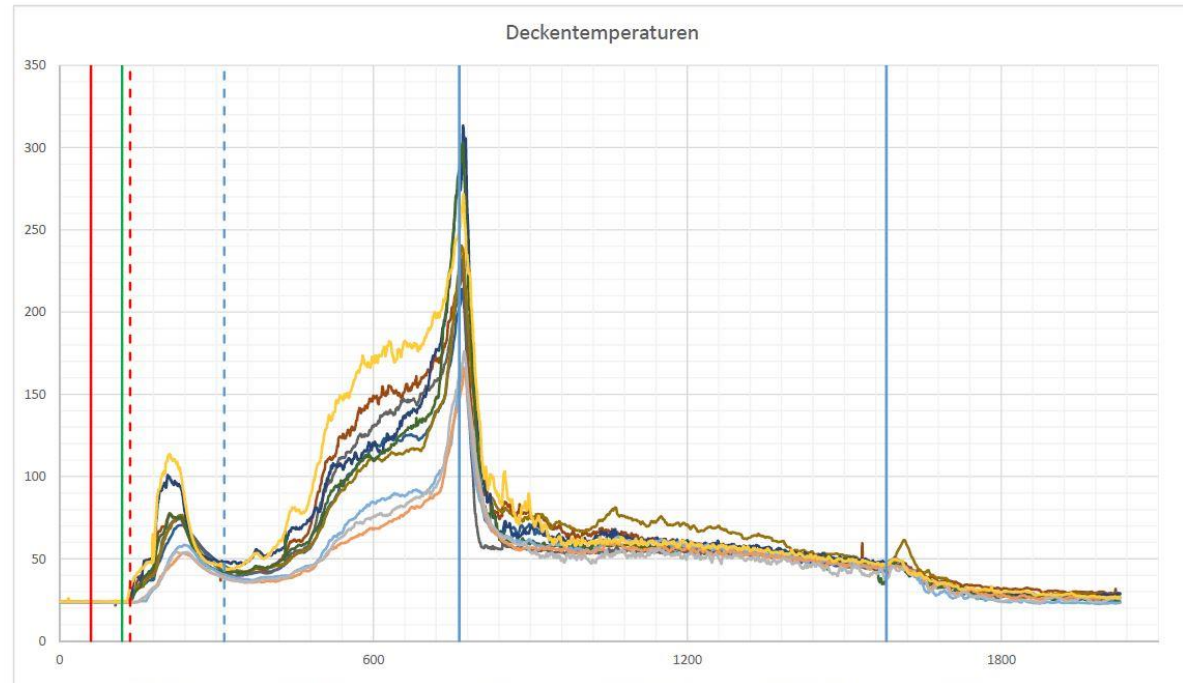
Video: Nullversuch in Zeitraffer, Quelle: AQUASYS

▲ activation after full developed fire at t=11'41"

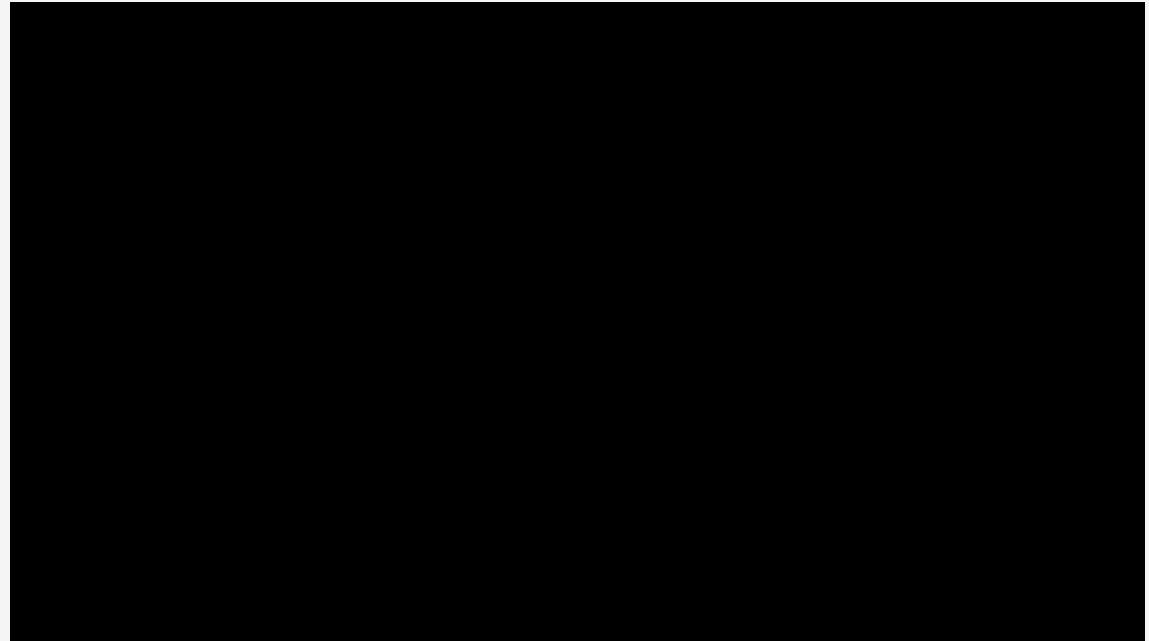
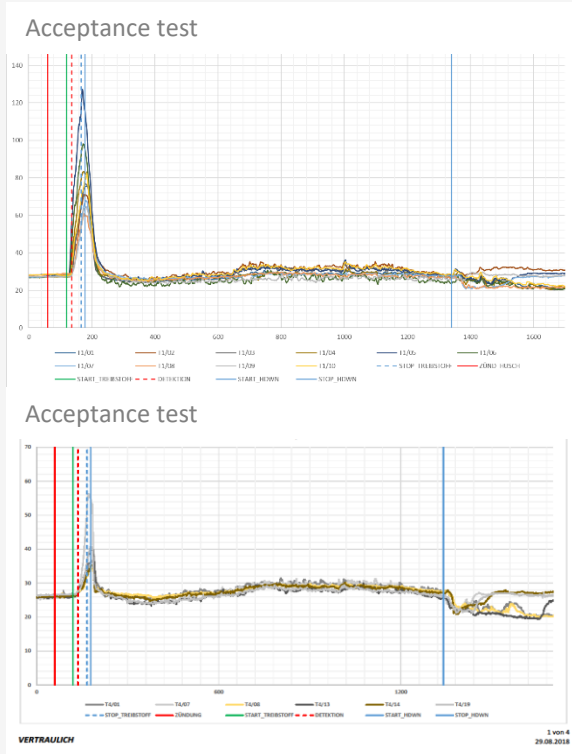
Full Scale Fire Test (free burn)

- ▲ > 11 min pre burn until fire fully developed
- ▲ Temperatures down to less than 80°C within 1 min

Free burn fire test



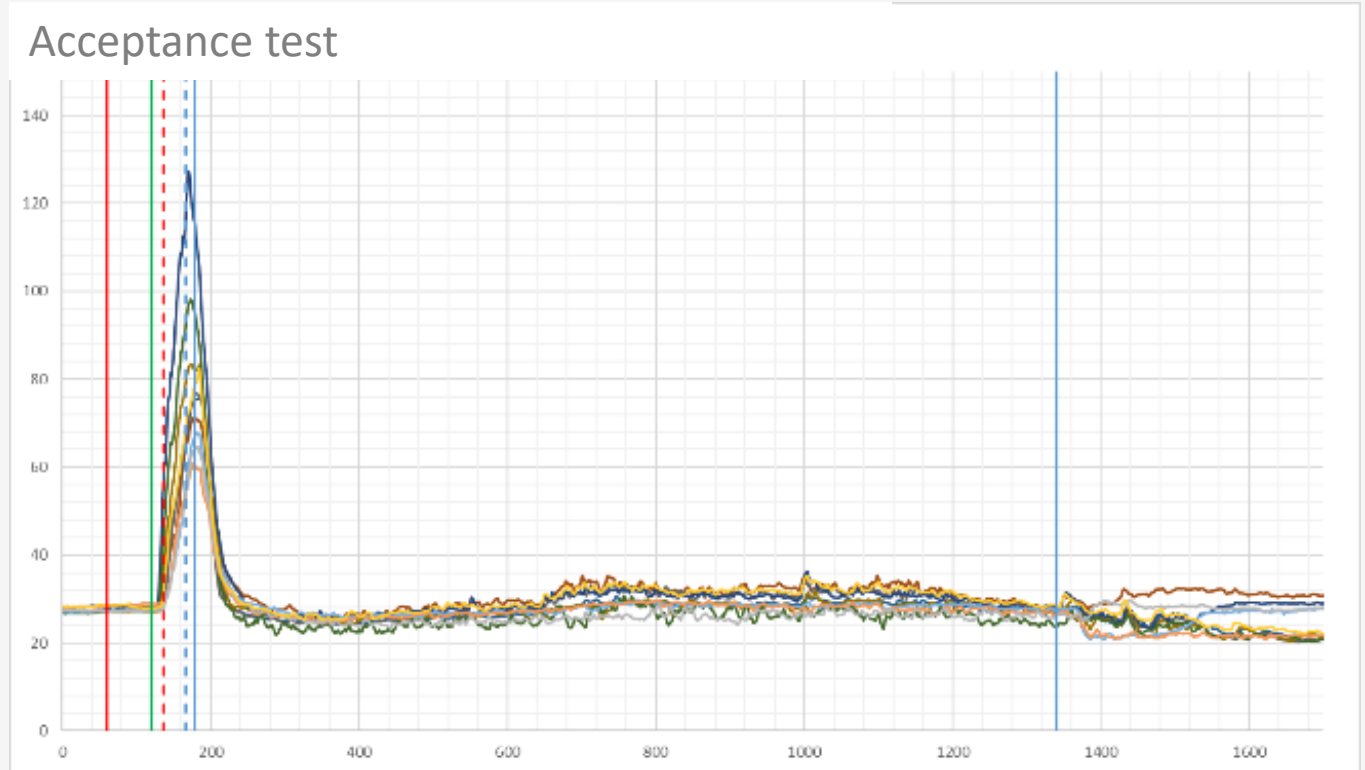
Full Scale Fire Test (acceptance test)



▲ activation after full developed fire at $t=1'58''$

Full Scale Fire Test (acceptance test)

- ▲ Detection time:
30 sec
- ▲ Activation:
after 2 min
pre burn time
- ▲ Temperatures
down to less
than 40°C
within 1 min





IWMA
International Water Mist Association

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Thank you!

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