FIREKILL™
More than just fire protection

Application of Low Pressure Water Mist Fire Protection in Data Centers

Miguel Martinez
Global Business Development Manager Data Centers

Miguel works since almost 20 years in the fire protection industry in the Benelux, he has been responsible for the sales of high- and low-pressure water mist systems from various manufacturers in this area.

Very recently he started as Global Business Development Manager at VID Fire-Kill, a leading water mist manufacturer with a wide range of solutions.

www.vidfirekill.com

IWMA
International Water Mist Association

FIREKILL™

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Application of Low Pressure Water Mist Fire Protection in Data Centers

Miguel Martinez, Global BDM, Data Centers

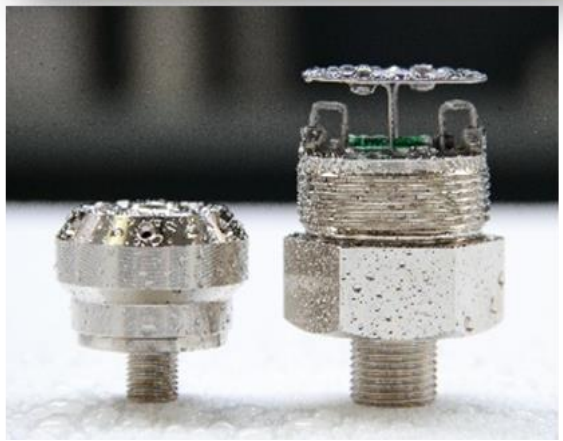
IWMA Webinar, 15 October 2020

Agenda

- Short company introduction
- Fire protection in Data Centers
- Why select water mist in a data center
- Why is FIREKILL™ so efficient
- Typical Data Center Hazards
- Codes and standards
- System layout FM approved FIREKILL™
- Risks with no FM test protocol for water mist
- Possibilities if no FM approval is needed
- Summary

Introduction VID Fire-Kill

- Global leader in the Low Pressure Water Mist Technology with a wide and unique range of solutions
- ISO9001 accredited R&D, Production and Sales company
- Headquarter located in Svendborg, Denmark
- Yearly + 500.000 components (nozzle, valves, etc) are manufactured and sold to 45 countries
- Founded in 2002 and is part of the CPH2002 Business Group



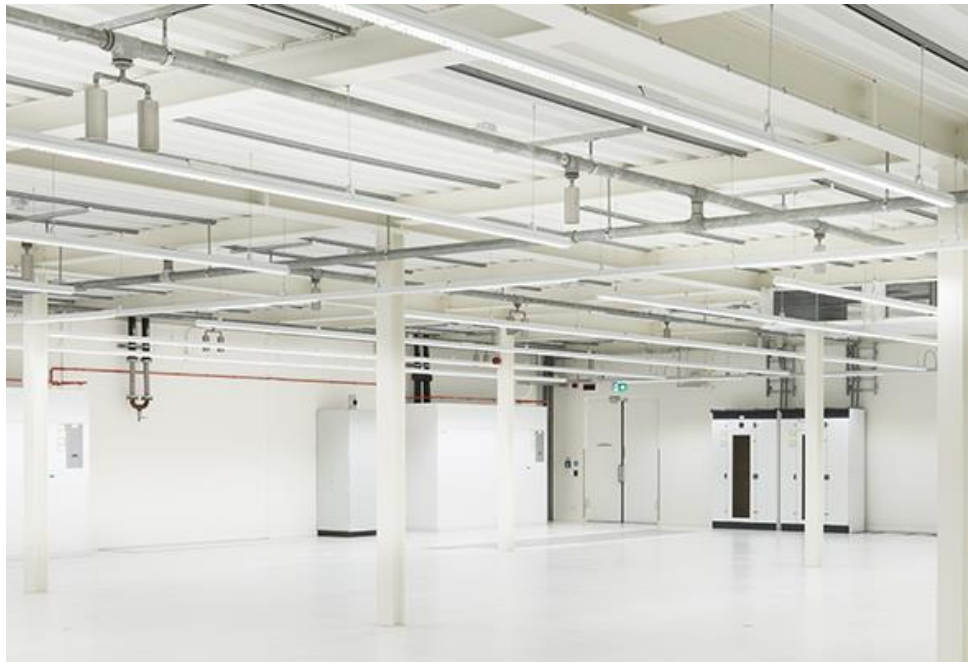
Fire protection in Data Centers

- Objectives fire protection system?
  - ✓ Extinguishing
  - ✓ Protect data (cabinets)
  - ✓ Control
  - ✓ Protect facility

- What has to be taken into account?
  - ✓ Objectives fire suppression
  - ✓ Configuration and infrastructure data center
  - ✓ Ventilation & cooling
  - ✓ Available space

Fire protection systems used in data centers

- Sprinkler systems
  - ✓ Wet pipe sprinklers
  - ✓ Pre-action sprinklers
- Gas suppression systems
  - ✓ Halocarbons
  - ✓ Inert gas
- Water mist systems
  - ✓ High and low pressure



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Why select water mist in a Data Center

- Water mist is an eco-friendly and sustainable technology
- Protection of all critical areas of a data center with one system
- Shorter lay-down time, no refilling required

https://journal.uptimeinstitute.com/fire-suppression-systems-bring-risk/

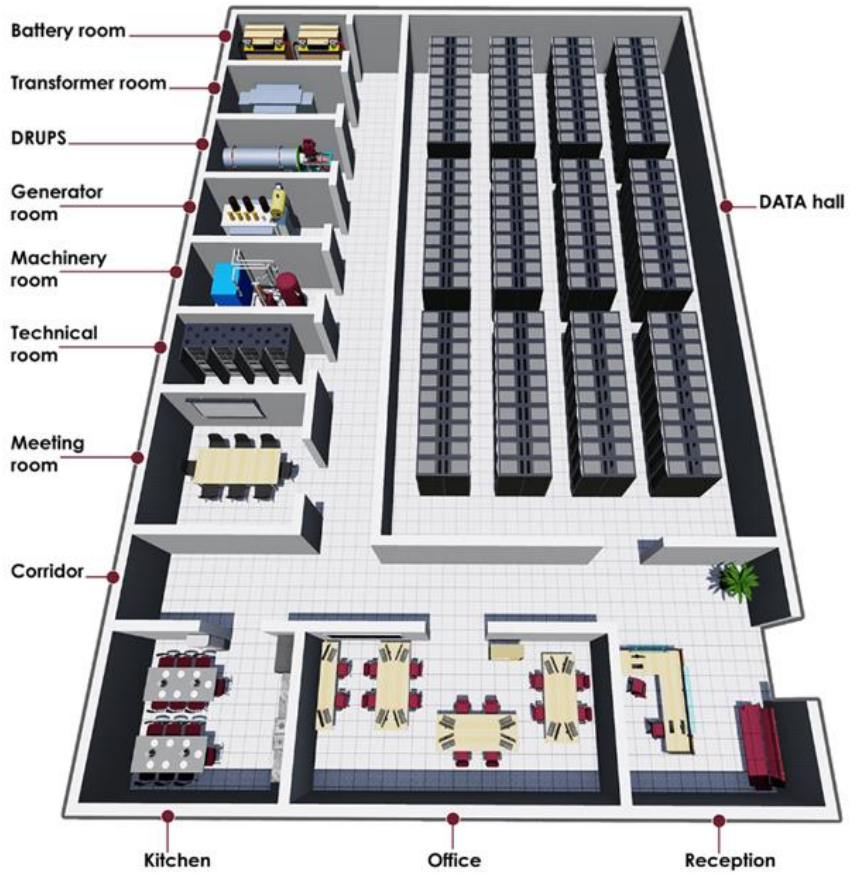
- Space saving and weigh less
- Lower maintenance cost

Why is FIREKILL™ so efficient in a Data Center

- FM Approved to protect all critical areas of data centers
- Fast, reliable and cost effective fire suppression solution
- No need for ventilation system shutdown
- Low water pressure and water flow rates
- Easy installation and low maintenance
- Energy efficient pumps

Typical Hazards found in Data Center

- Office / circulation spaces
- Data halls
- Electrical rooms (MDF / MMR)
- Transformer / generator rooms
- UPS Battery rooms
- Storage rooms
- Loading bays



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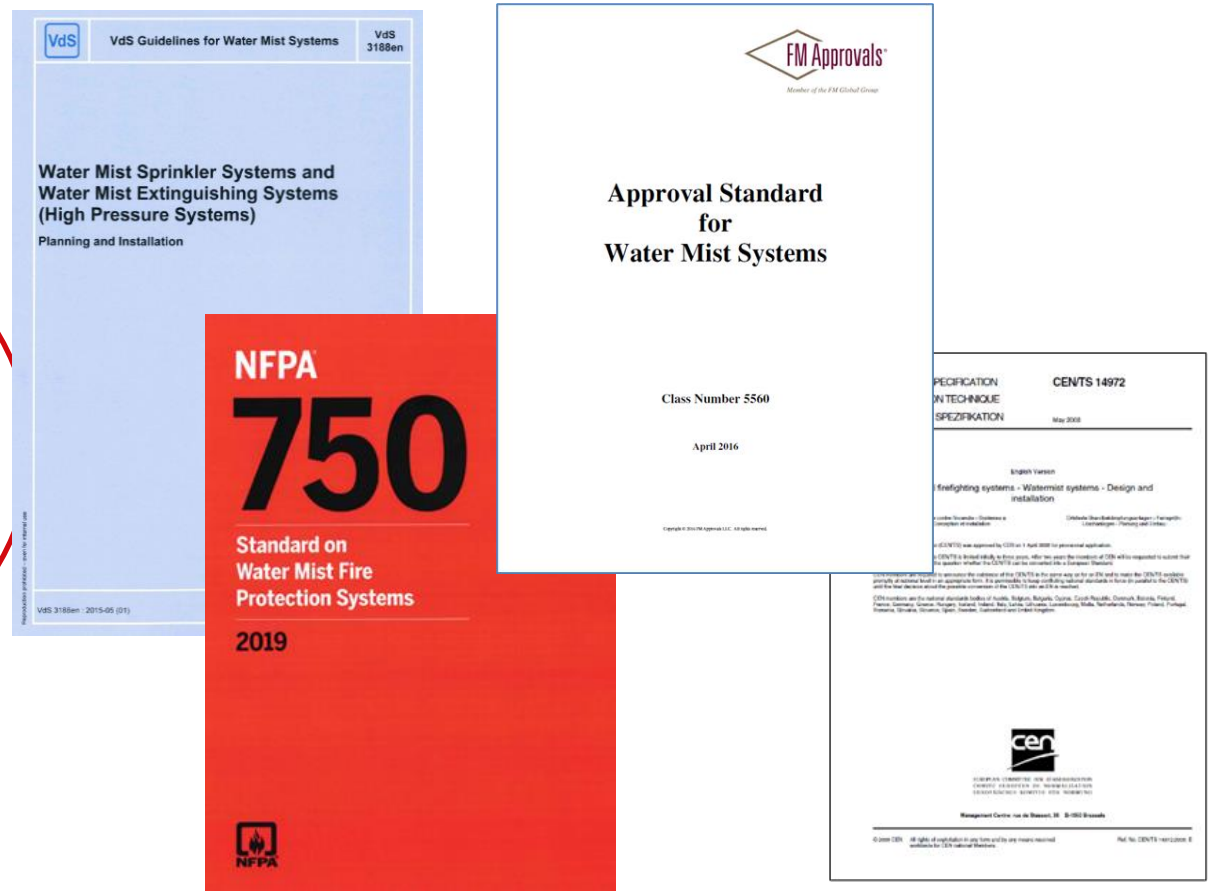
Codes and standards used in Data Centers

- prEN 14972
- EN 12845
- CEA4001
- BSI
- D2 APSAD
- VDS
- NFPA 750 / NFPA 13
- FM 5560
- FM DS 4-2
- FM DS 5-32
- FM DS 3-26
- UL

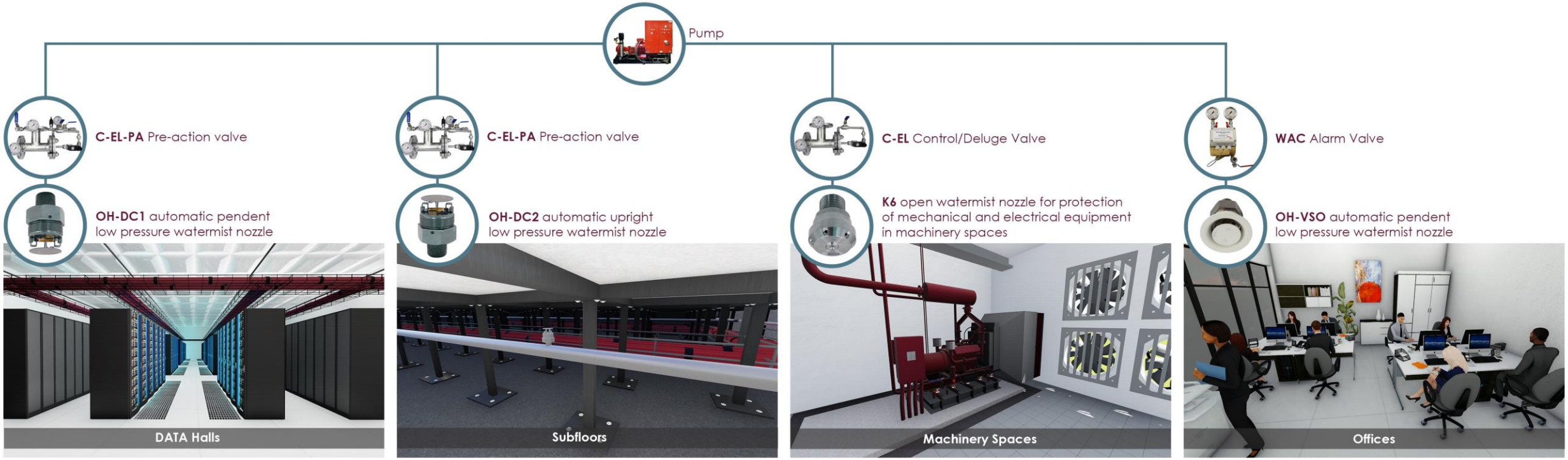


TESTING REQUIRED FOR FM APPROVAL

All FM Approved water mist fire protection systems have undergone extensive testing in accordance with the requirements of Standard 5560, Approval Standard for Water Mist Systems.

Approval Standard 5560 provides test requirements for specific occupancies and applications that FM Approvals has tested and verified. These specific applications and occupancies are covered in appendices to the standard.

System layout Data Center protection



Offices / circulation spaces (HC-1)

- Lightly loaded non storage areas with ordinary combustibles (FM 5560 Appendix G)
- Wet systems

FIREKILL™ Solution: OH-VSO Nozzle

- Nozzle type : Pendent
- Water pressure at the nozzle : 8 bar to 16 bar
- K-factor (metric) : 16,7 (l/min@1 bar)
- Design area of operation offices : 140 m2 or 9 nozzles
- Design area circulation spaces : 5 nozzles
- Maximum Spacing : 4,50 meter
- Maximum height (FM) : 5,00 meter

FM APPROVED

Certificate of Compliance

This certificate is issued for the following:

System Designation:	FIREKILL™ Occupancy Protection System using Model OH-VSO & OH-OS automatic nozzles
Design, Installation, Operation and Maintenance Manual:	FIREKILL™ Occupancy Protection System using Model OH-VSO & OH-OS automatic nozzles, Design, Installation, Operation and Maintenance Manual (DIOM) for protection of Non-Storage Occupancies, Hazard Category 1 (HC-1), Doc. No.: 40605-02-03, Issue/Date: September 28, 2015

Prepared for:
VID FIRE-KILL APS
SVALBARDVEJ 13
SVENDBORG
DK-5700
DENMARK

Manufactured at:
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SVALBARDVEJ 13
SVENDBORG
DK-5700
DENMARK

FM Approvals Class: 5560

Approval Identification: 3053358 Approval Granted: October 14, 2015

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

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Data hall above raised floor

- Data Processing Equipment Rooms/Halls above Raised Floor (FM 5560 Appendix M)
- Single interlock Pre-action system

FIREKILL™ Solution: OH-DC1 Nozzle

- Nozzle type : Pendent
- Water pressure at the nozzle : 8 bar to 16 bar
- K-factor (metric) : 13,4 (l/min@1 bar)
- Design area of operation : 6 nozzles
- Maximum Spacing : 3,60 meter
- Maximum height (FM) : 5,00 meter

FM APPROVED

Certificate of Compliance

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Water Mist System

System Designation:	FIREKILL™ Low Pressure Water Mist System for the Protection of Data Processing Equipment Rooms/Halls - Above and Below Raised Floor
Design, Installation, Operation and Maintenance Manual:	FIREKILL™ Low Pressure Water Mist System for Protection of Data Processing Equipment Rooms/Halls Above and Below Raised Floors Design, Installation, Operation, and Maintenance (DIOM) Manual, Document ID: 180209-01-16, Revision: 06, Date of Issue: 23-04-2019

Prepared for:
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DENMARK

Manufactured at:
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FM Approvals Standard Class: 5560 - April 2016

Approval Identification: PR448914 Approval Granted: May 30, 2019

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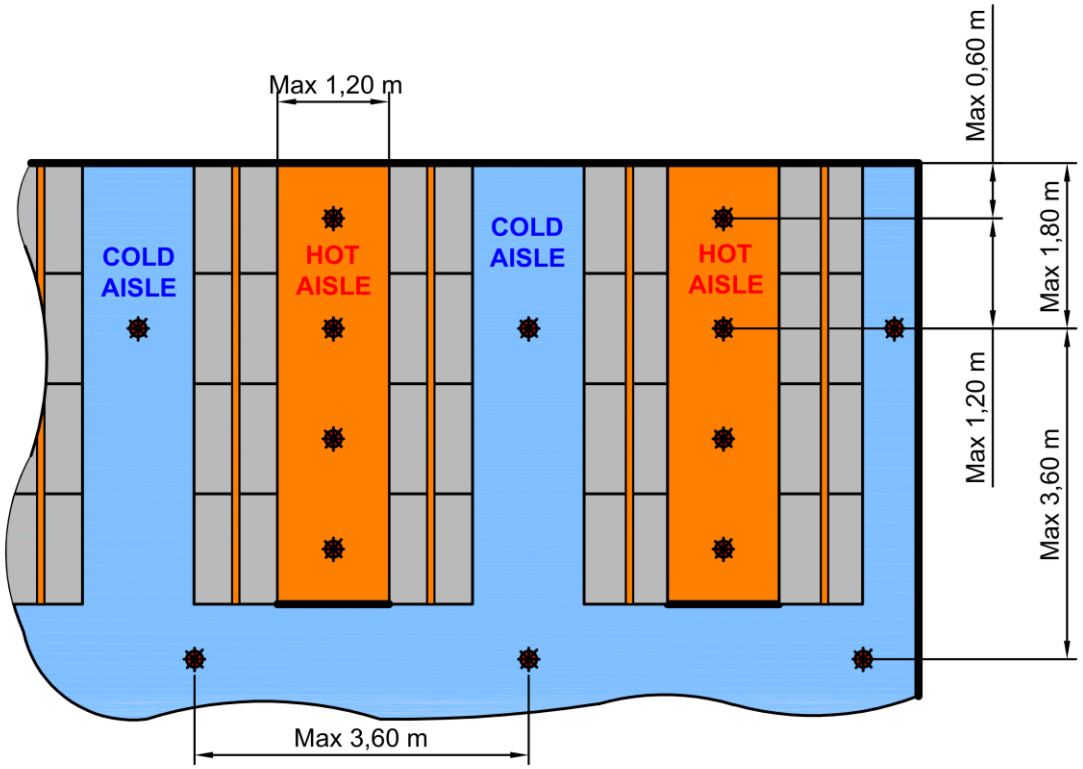
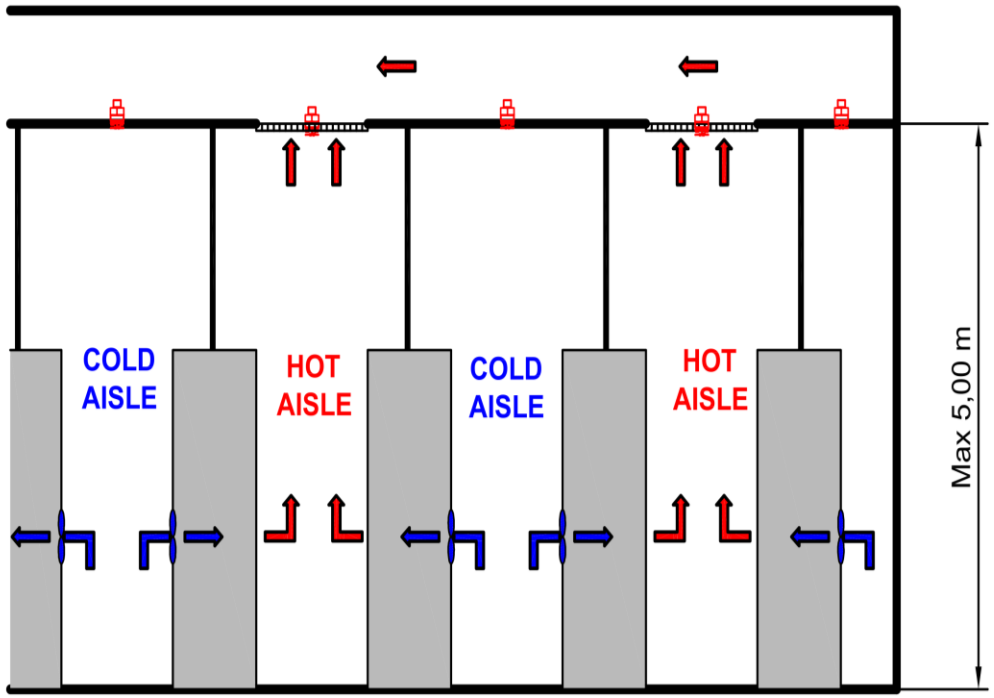
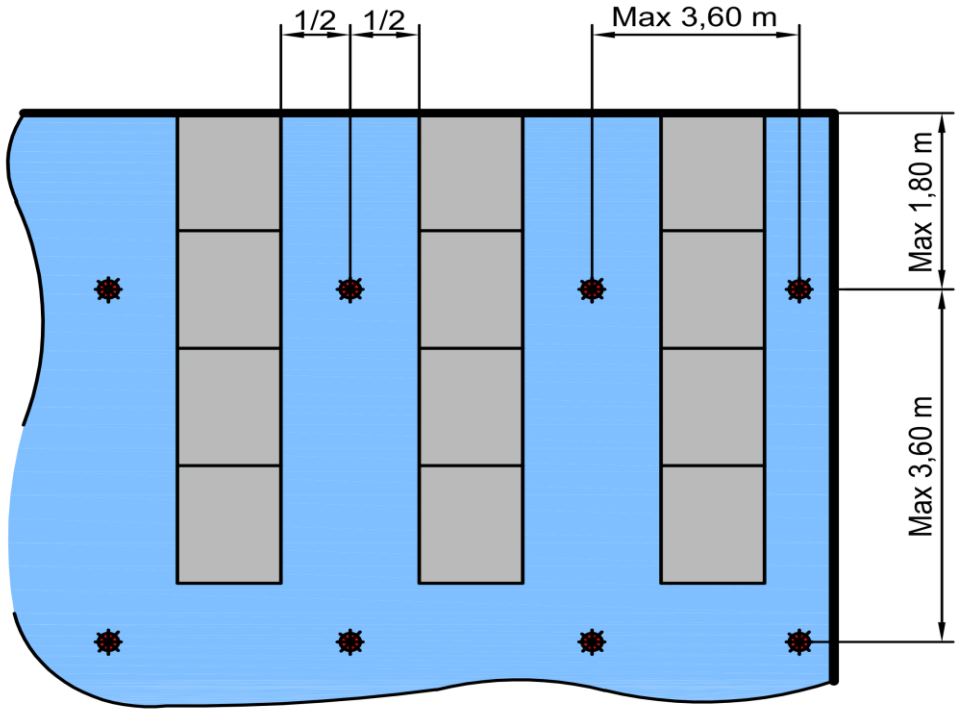
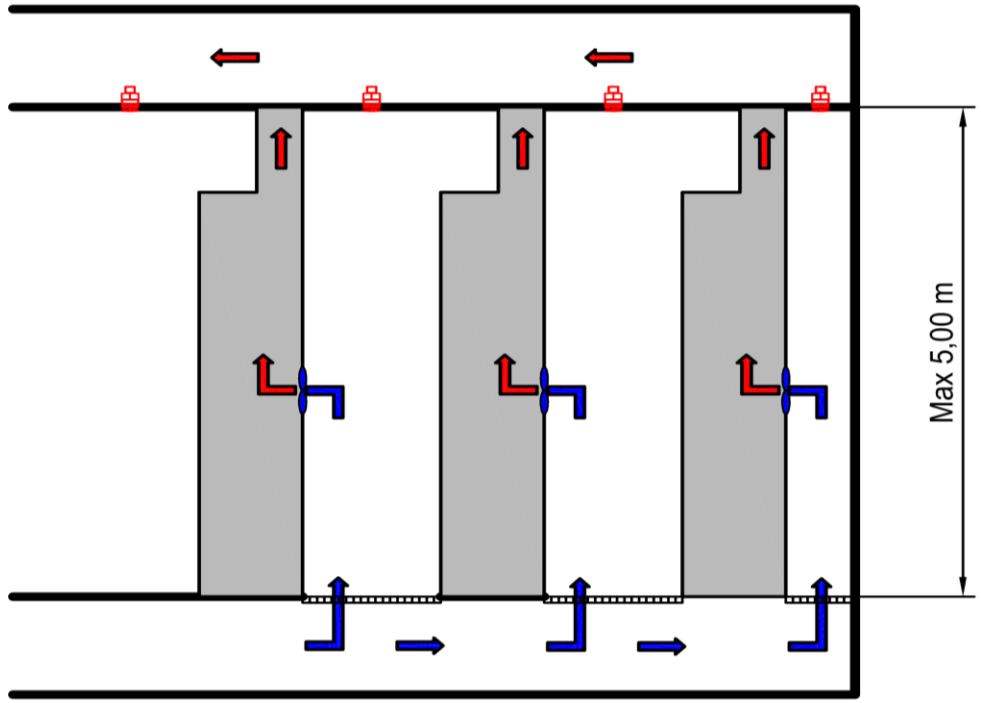
Above raised floor solution "with hot aisle"



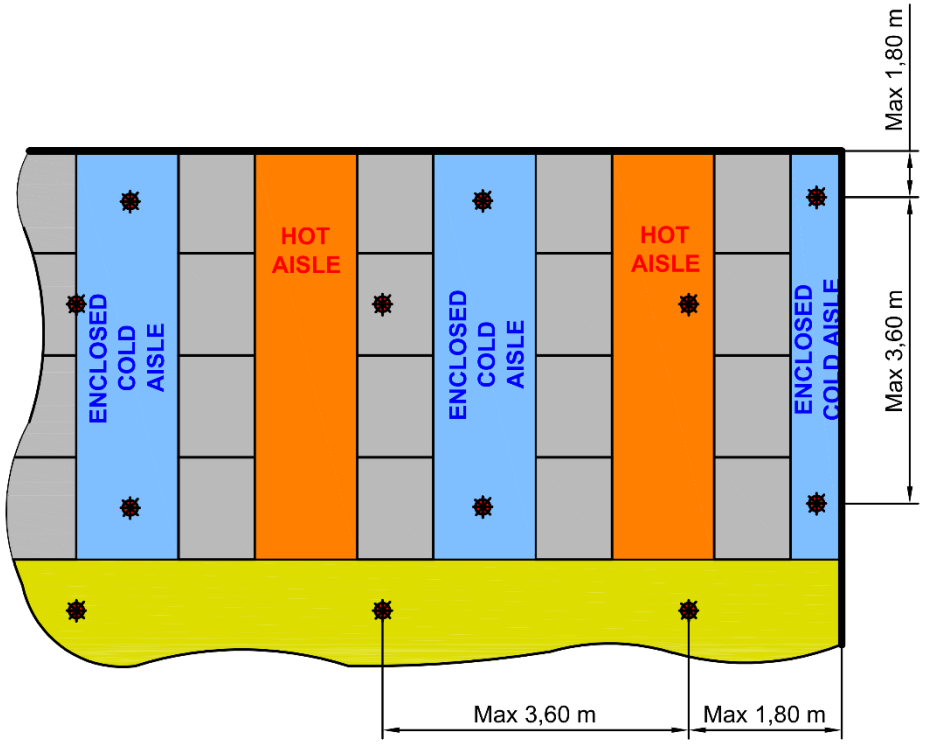


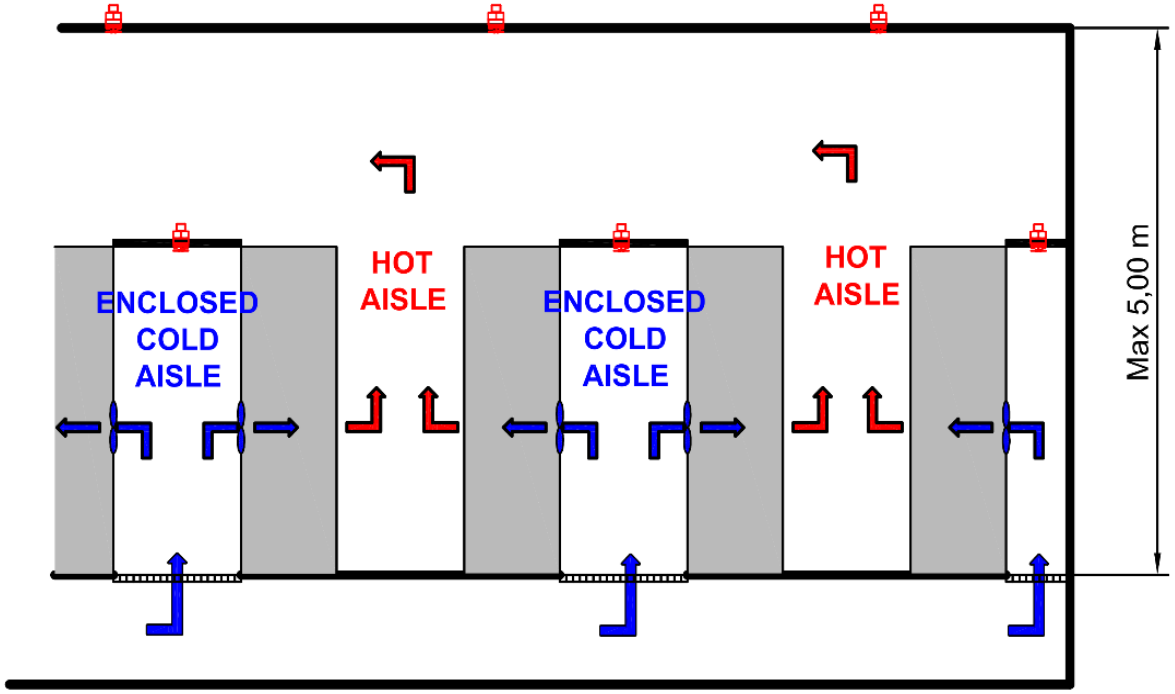
Above raised floor solution "without hot aisle"



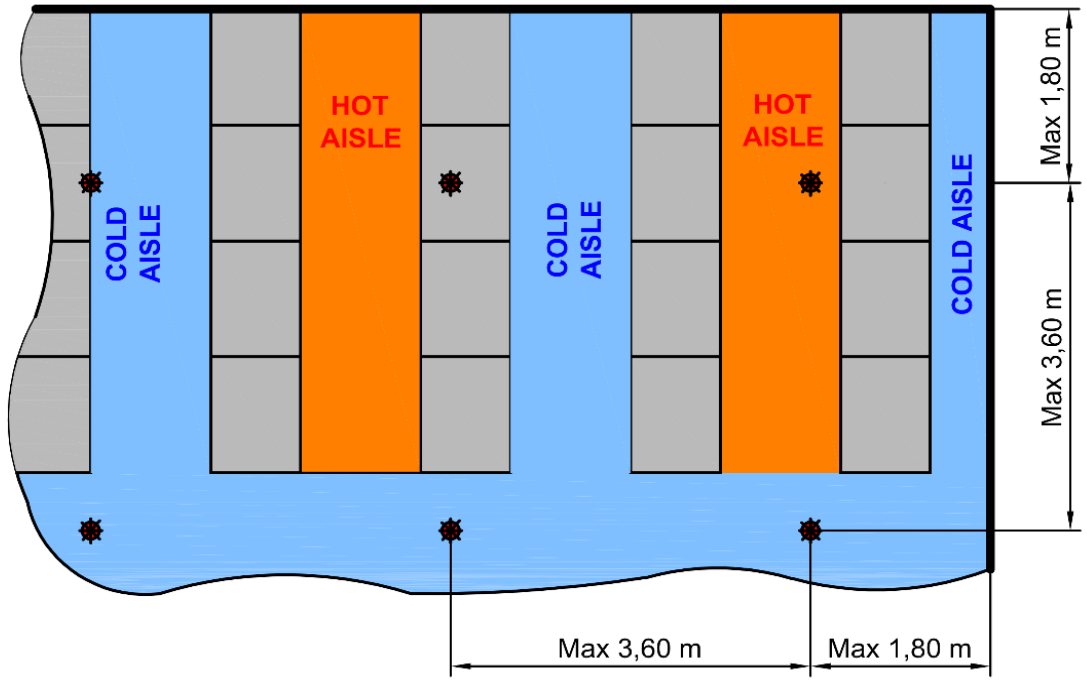


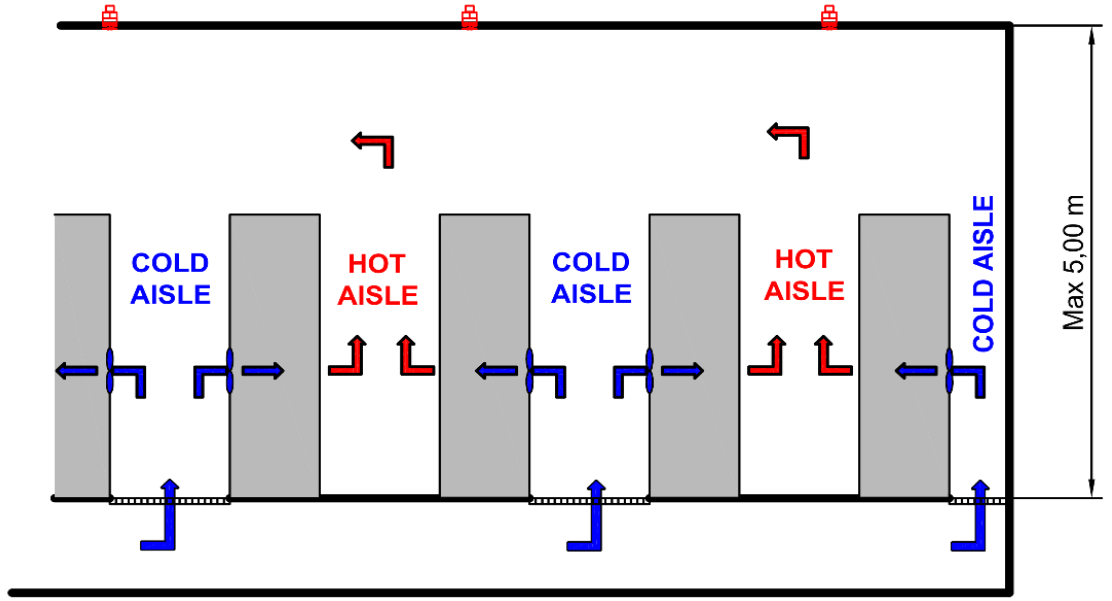
Above raised floor solution "enclosed cold aisle"





Above raised floor solution





Data hall below raised floor

- Data Processing Equipment Rooms/Halls below Raised Floor (FM 5560 Appendix N)
- Wet or single interlock Pre-action system

FIREKILL™ Solution: OH-DC2 Nozzle

- Nozzle type : Upright
- Water pressure at the nozzle : 8 bar to 16 bar
- K-factor (metric) : 13,85 (l/min@1 bar)
- Design area of operation : 6 nozzles
- Maximum Spacing : 3,60 meter
- Maximum height (FM) : 1,00 meter

FM APPROVED

Certificate of Compliance

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FM Approvals Standard Class: 5560 - April 2016

Approval Identification: PR448914 Approval Granted: May 30, 2019

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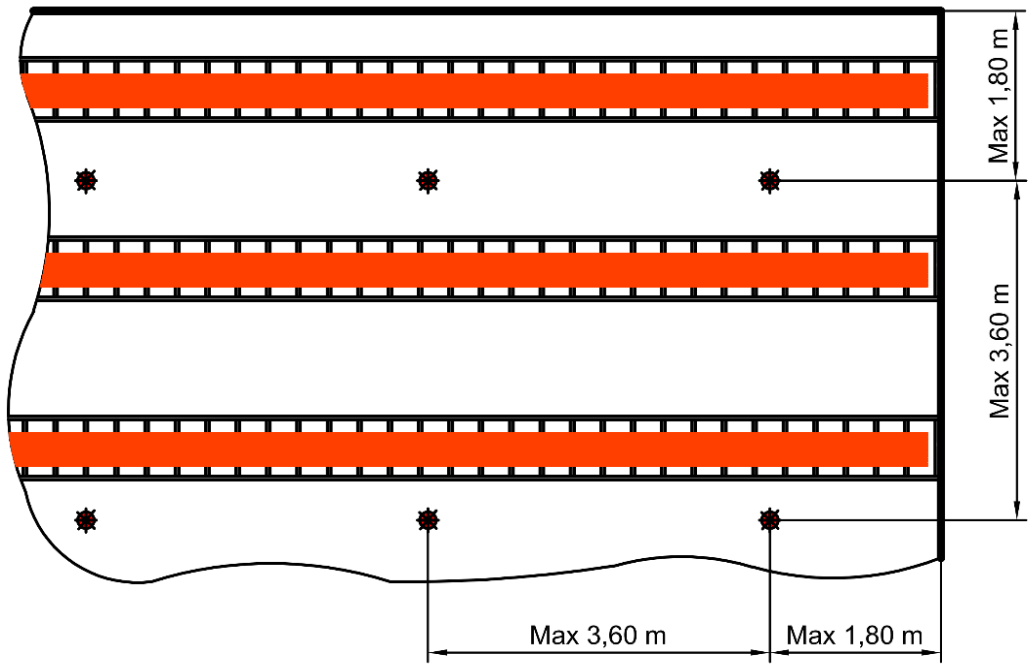
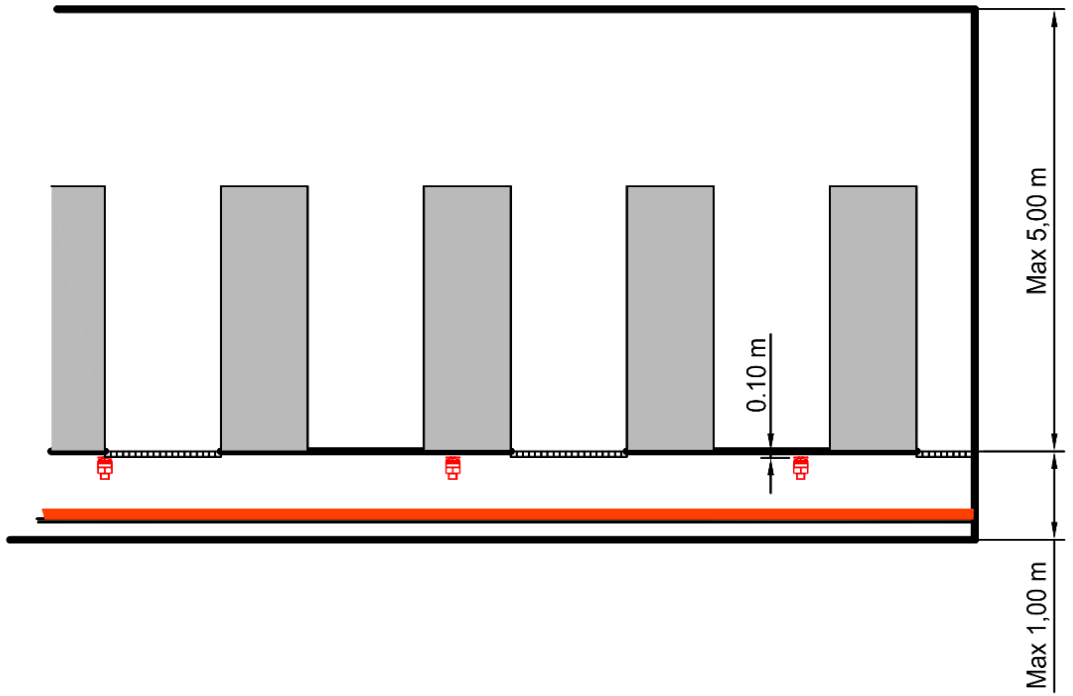
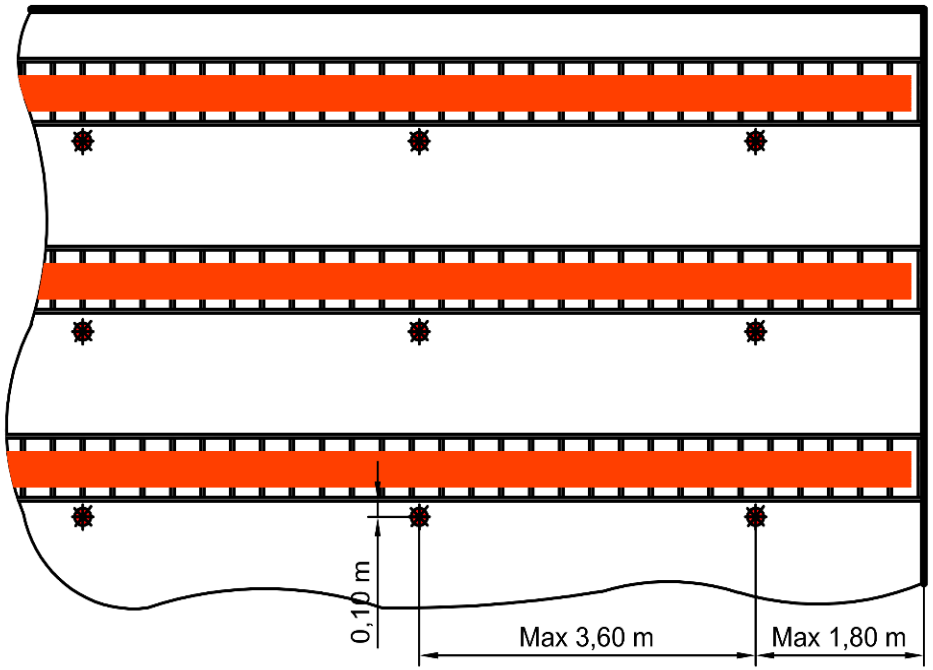
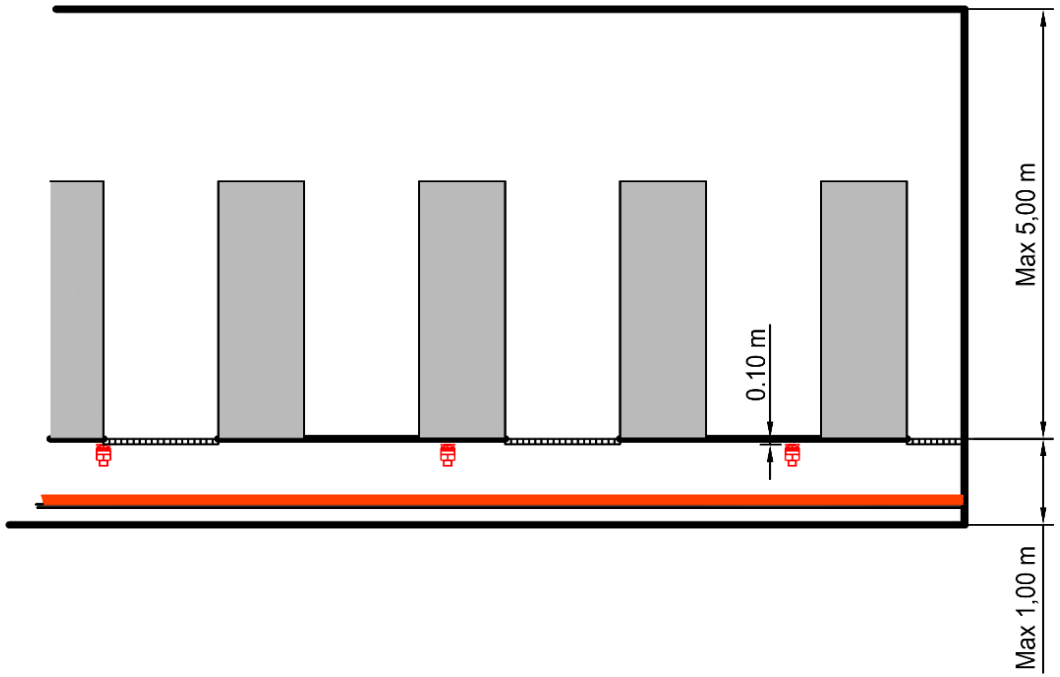
Below raised floor solution "area coverage"





Below raised floor solution "local coverage"





Electrical rooms (MDF / MMR) (HC-1)

- Lightly loaded non storage areas with ordinary combustibles (FM 5560 Appendix G)
- Wet or single interlock Pre-action system

FIREKILL™ Solution: OH-VSO Nozzle

- Nozzle type : Pendent
- Water pressure at the nozzle : 8 bar to 16 bar
- K-factor (metric) : 16,7 (l/min@1 bar)
- Design area corridors : 5 nozzles
- Design area of operation : 140 m2 or 9 nozzles
- Maximum Spacing : 4,50 meter
- Maximum height (FM) : 5,00 meter

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DENMARK

Manufactured at:
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DENMARK

FM Approvals Class: 5560

Approval Identification: 3053358 Approval Granted: October 14, 2015

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Generator / Transformer Rooms (machinery Spaces)

- Enclosures with machinery using liquid hydrocarbon fuel and lubrication fluids with volatilities less than or equal to heptane (FM5560 Appendix C, E, F)
- Total flooding system

FIREKILL™ Solution: K6 Nozzle

- Nozzle type : Pendent
- Water pressure at the nozzle : 7,7 bar to 16 bar
- K-factor (metric) : 5,6 (l/min@1 bar)
- Room volume : 320 / 800 / 4610 m³
- Maximum Spacing : 4 meter
- Maximum height : 12 meter

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Certificate of Compliance

This certificate is issued for the following:

System Designation:	FIREKILL™ Total Flooding System Using Model K6 Open Nozzles for the protection of machinery in enclosures with volumes up to, and including, 162,800 ft3 (4610 m3) at a maximum height of 39.4 ft (12.0 m)
Design, Installation, Operation and Maintenance Manual:	FIREKILL™ Total Flooding System Using Model K6 Open Nozzles Design, Installation and Maintenance (DIOM) Manual for protection of machinery and combustion turbines in enclosures, Doc No 110629-02-03, dated 21st May 2015

Prepared for:
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DK-5700
DENMARK

Manufactured at:
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DENMARK

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Other risks (HC-2 / HC-3)

- Risks with no FM test protocol for water mist
  - ✓ UPS Batterie rooms (HC2)
  - ✓ Storage rooms (HC3)
  - ✓ Loading bays (HC3)
- Approved sprinklers solution (FM 2-0) using the same pump as for the other risks

Water mist solution for HC-2 & HC-3 hazards

- FM soon releasing Fire Test Protocol for Water Mist System Protection of Non-Storage Occupancies, Hazard Category 2 (HC-2) and Hazard Category 3 (HC-3) for water mist. (Maximum ceiling height can be approx. 9 meter)

Possibilities if no FM approval is needed

- Office / Circulation spaces / Data halls / Electrical rooms
  - ✓ FIREKILL™ Solution: OH-VSO Nozzle up to 6 meters height
  - ✓ In accordance with PrEN 14972-part 4 test protocol (HC1)

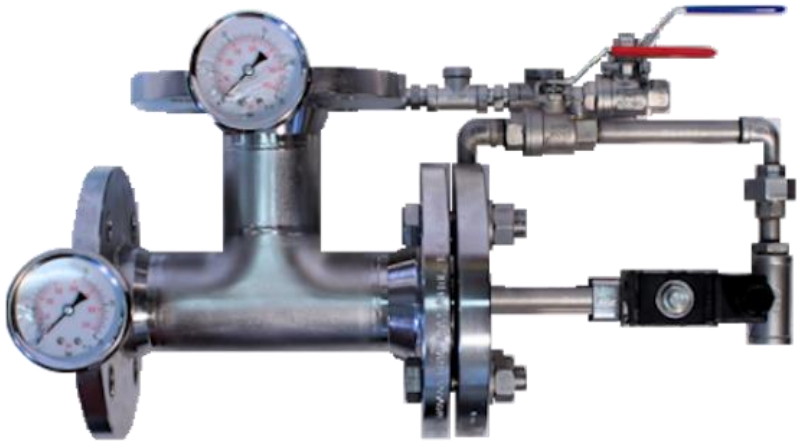
- Transformer / generator rooms (FM approved Pending)
  - ✓ FIREKILL™ Solution: K7 Nozzle (Local application)
  - ✓ In accordance with PrEN 14972 ANNEX A
  - ✓ No limitation on height or volume room, run time 10 minutes

- UPS battery / storage rooms / loading bays
  - ✓ FIREKILL™ Solution: OH-PX2 Nozzle
  - ✓ In accordance with PrEN 14972-part 2 test protocol (OH3 storage)

Valves

The **FIREKILL™** series of valves includes alarm valves, deluge valves, pre-action valves and pressure reducing valves

- Model WAC Alarm valve, DN40 and DN50
- Model C-EL PA Pre-Action valve DN 50 and DN 80



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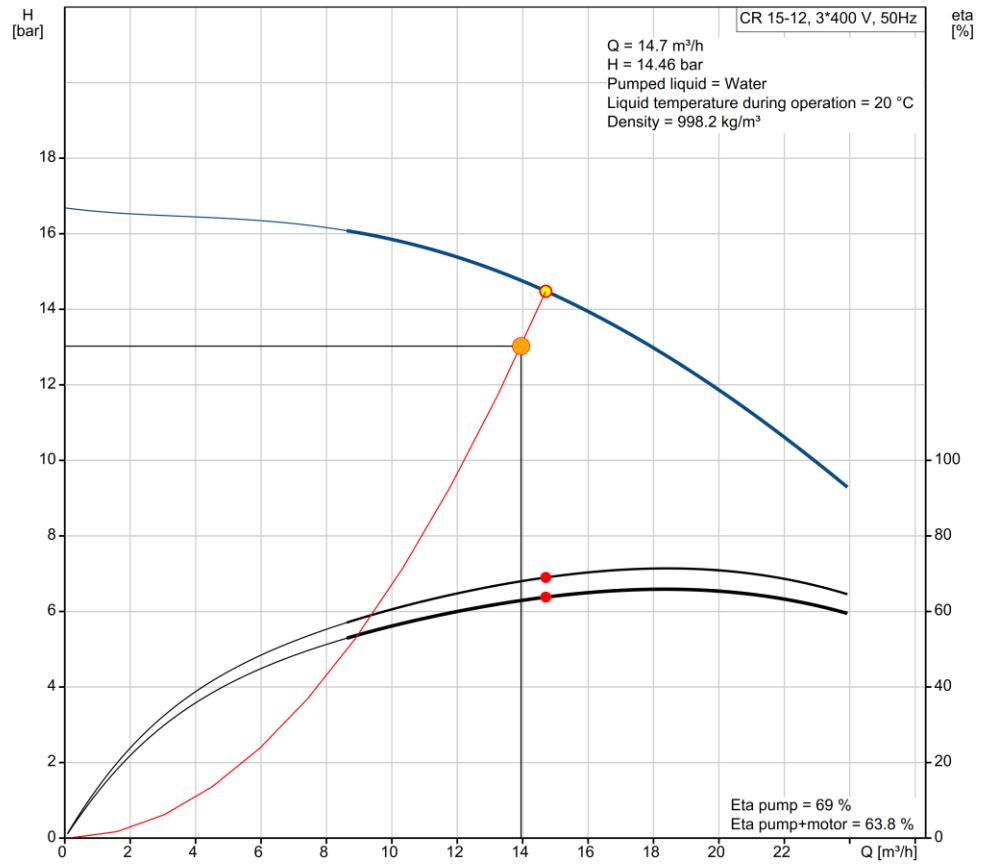
Filters

The **FIREKILL™** series of filters included high capacity filter with or without monitoring and isolation valves

- Model F Basic without monitoring, DN50 and DN80
- Model F Basic with monitoring, DN50 and DN80
- Model F Isolation valves, DN50 and DN80

Typical low pressure water mist pump



Multistage centrifugal pump:

Typical pump curve 14 m3/h @14 Bar
Required power: 11 kW

Summary

- FM5560 is the only fire test protocol that is suitable for data center applications
- VID Fire-Kill is the most reliable and cost effective fire suppression solution
- VID Fire-Kill has obtained the best results for the above raised floor data halls solution
- Can be combined with sprinkler technology to offer a FM approved solution and use only one pump !!
- Enjoy our datacenter animation for a quick wrap up

VID Fire-Kill ApS

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Thank You