

FM



**Verenigde
Sprinkler Industrie**

onderdeel van Federatie Veilig Nederland

FM Workshop Fire Safety

SPECIFYING SPRINKLER PROTECTION TO FM STANDARDS

9 & 10 June 2026

Welcome to the FM workshop

Fire Safety in Utrecht

Fire Safety



Escape route
Sprinkler protection

Practical

Fire Evacuation Procedures

- The fire alarm is not scheduled for testing today. If it sounds, please exit through the two emergency routes. Go outside to the assembly point

Toilets

- Located outside the meeting room at the Foyer.

Breaks and refreshments

- Drinks will be available during the breaks in the Foyer.
Lunch buffet will be served in the restaurant on the ground level.

Parking

- Free parking, get your ticket

Free WiFi: Hotel Utrecht

FM Workshop Agenda – 2 days

Day 1

- 9.00 Opening, introduction FM,
Protected by longitudinal flue space design
- 9.45 DS overview and interaction DS's
Building construction and Occupancy specific hazards
- 10.25 **Break**
- 10.45 Non-storage and low piled storage
- 11.15 Commodity classification
- 12.00 **Lunch**
- 13.00 Storage hazards
Workshop storage hazards
- 14.15 **Break**
- 14.30 OTC Open Top Containers
Automated storage and retrieval systems
Special hazards
Water supply
- 17:00 Closing day 1 + optional network

Day 2

- 9.00 Opening Day 2 + parking lot Day 1
NL-certificering & FM
Approval guide
Ceiling sprinkler installation - PART 1
- 10.30 **Break**
- 10.45 Ceiling sprinkler installation - PART 2
Exposure sprinklers
- 12.00 **Lunch**
- 13.00 In-rack sprinklers
Workshop IRAS
- 14.00 General considerations
- 14.30 **Break**
- 14.45 Water supplies
Plan review heavy version(Specifications, Hydraulic calcs, drawings,...)
Most common pitfalls
Field acceptance
Parking lot questions & closing
- 17:00 End of Workshop

GOALS

1.FM Data Sheets – research-based solutions:

To demonstrate that FM Data Sheets are based on rigorous engineering research.

2.Impact on Sprinkler Projects:

To give an overview of the key details in our Data Sheets that significantly impact the design, installation and the performance of the sprinkler systems.

3.Adopting FM Data Sheets:

To encourage you to make FM Data Sheets your standard of choice.

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[> To powerpoint master](#)



Who, what, why - FM Loss Prevention Data Sheets

27&28 May / 9&10 June 2026



Protect Your Purpose



Mutual



Specialty
insurer



Protecting today
and tomorrow



Service delivered
globally

How do you protect today and tomorrow?



Science based



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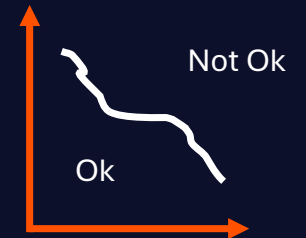
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Globally consistent



1800 Field
Engineers



Example

- Research based solutions
- Datasheets – state of the art

Example Smoke Vents:

- Effect on sprinkler performance
- Revised guidance in Datasheet 2-0

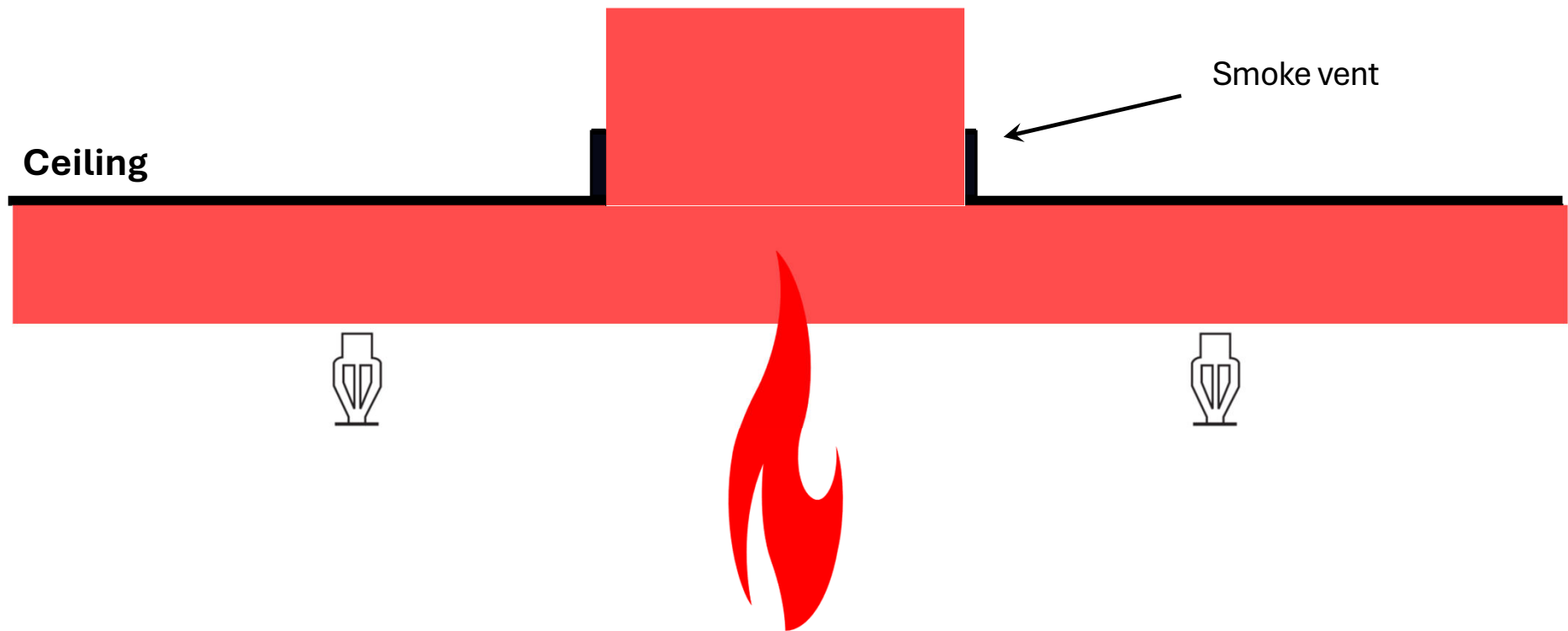
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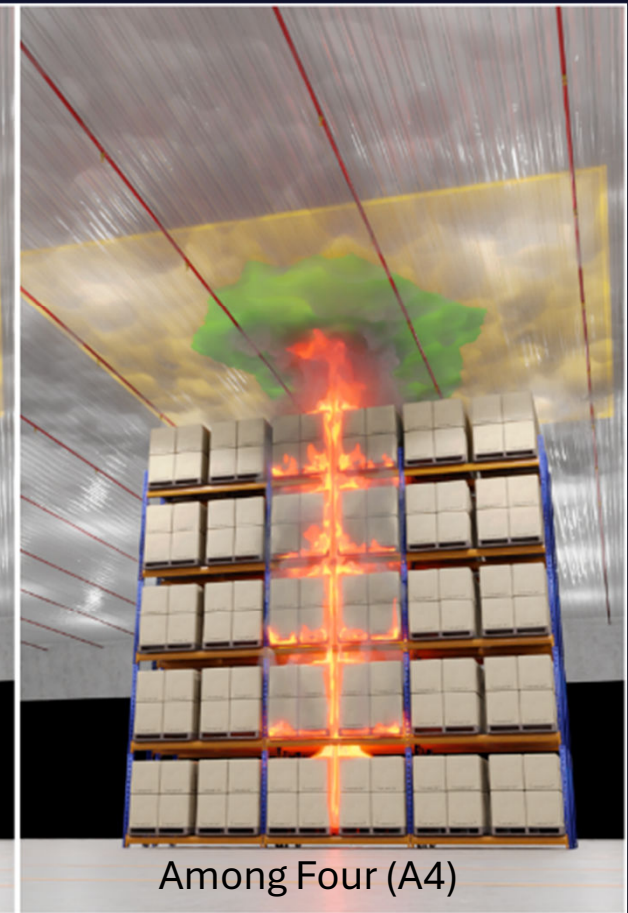
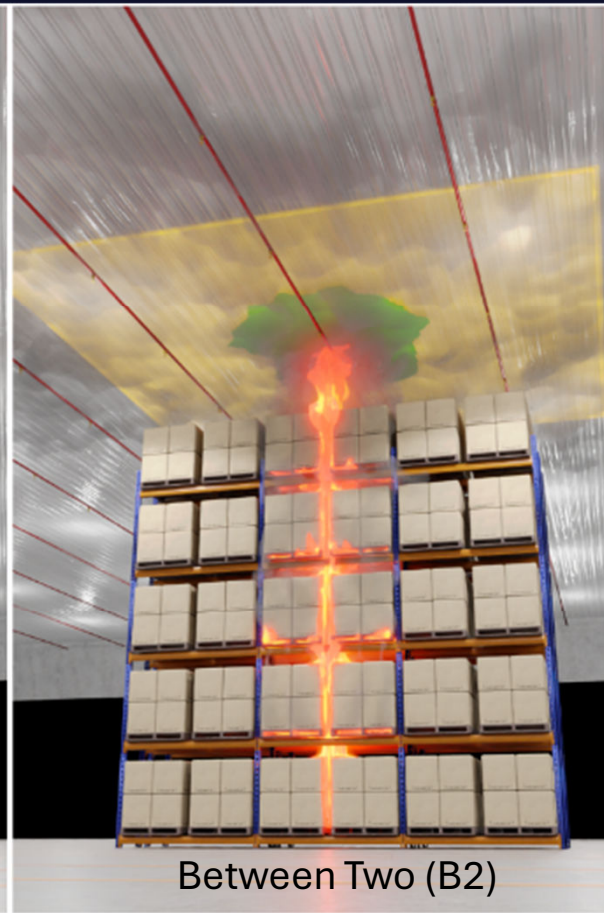
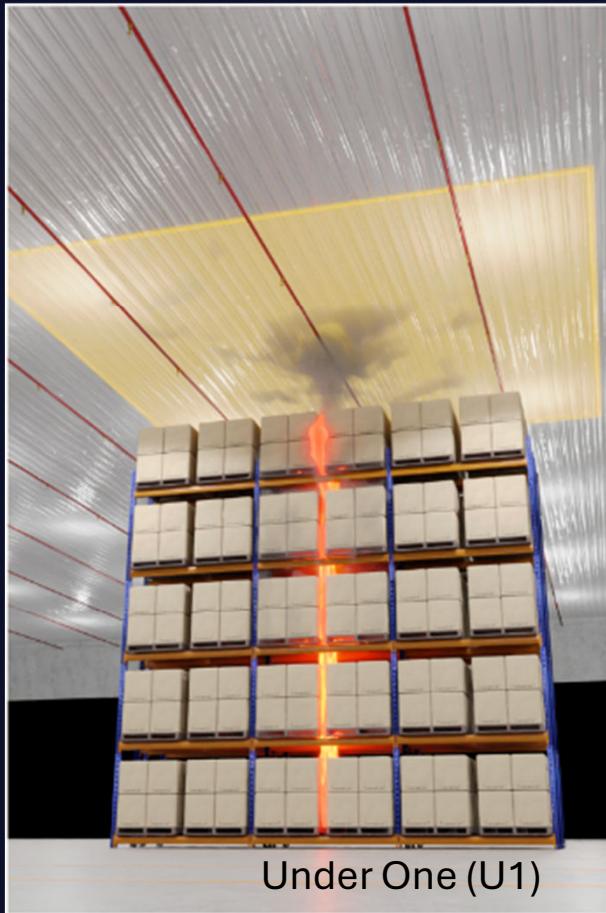
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Smoke Vents – Effect on Sprinkler Performance

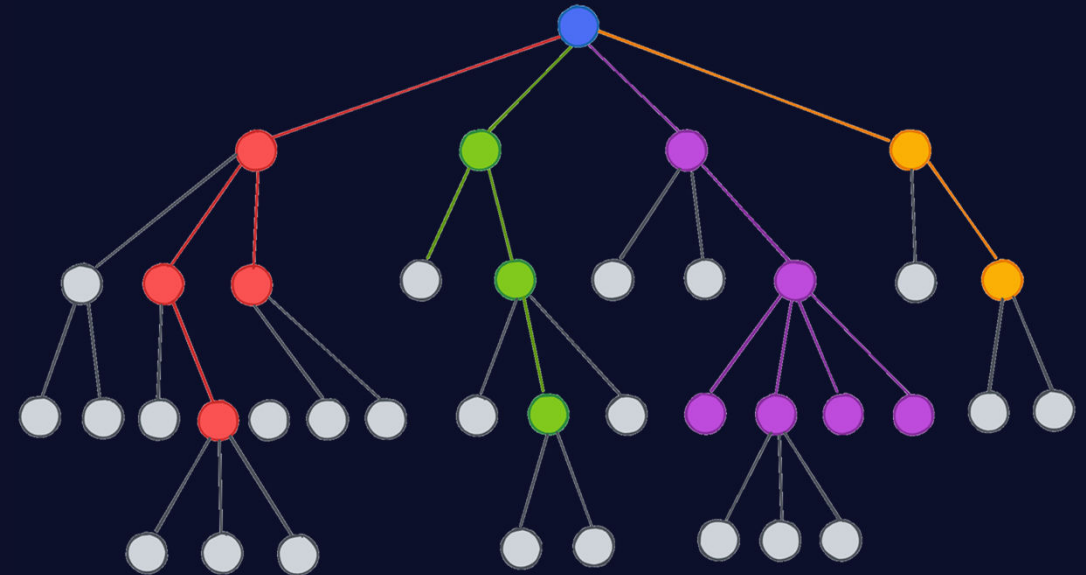
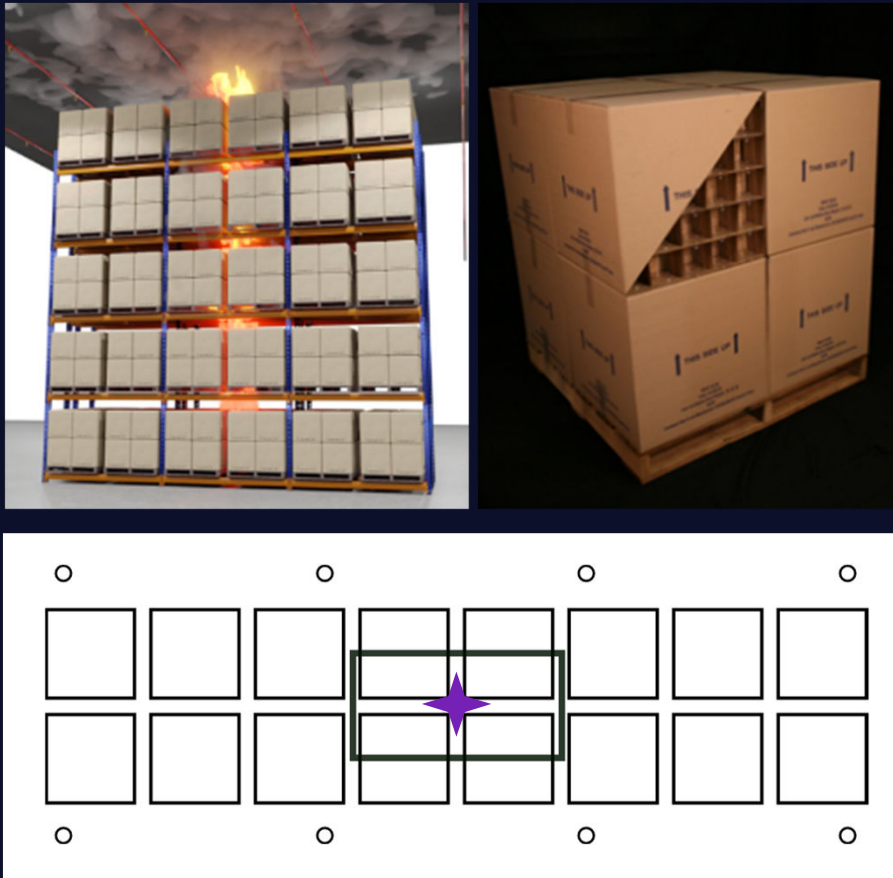
Problem?



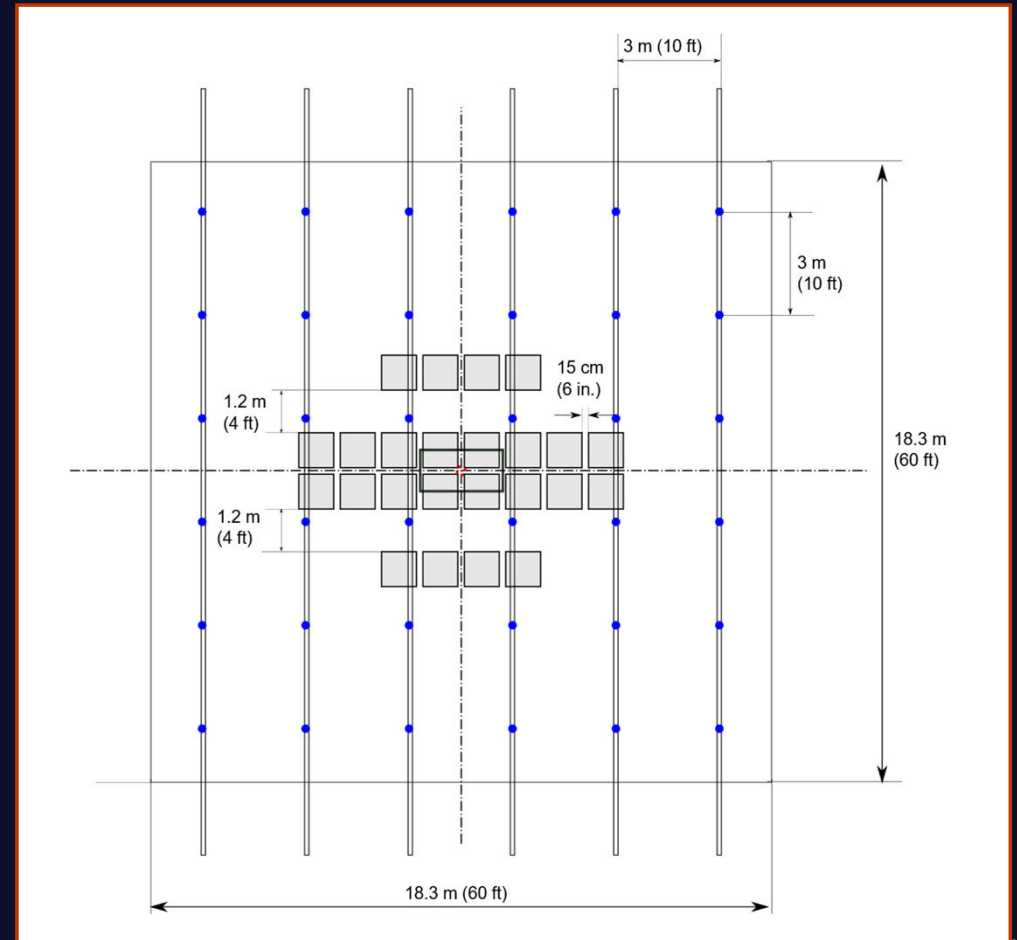
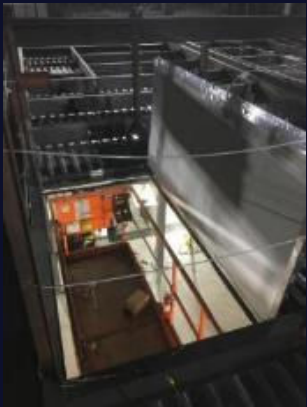
Explore the problem - modelling



The right tests



Large-scale Fire Tests - Configuration



00:30

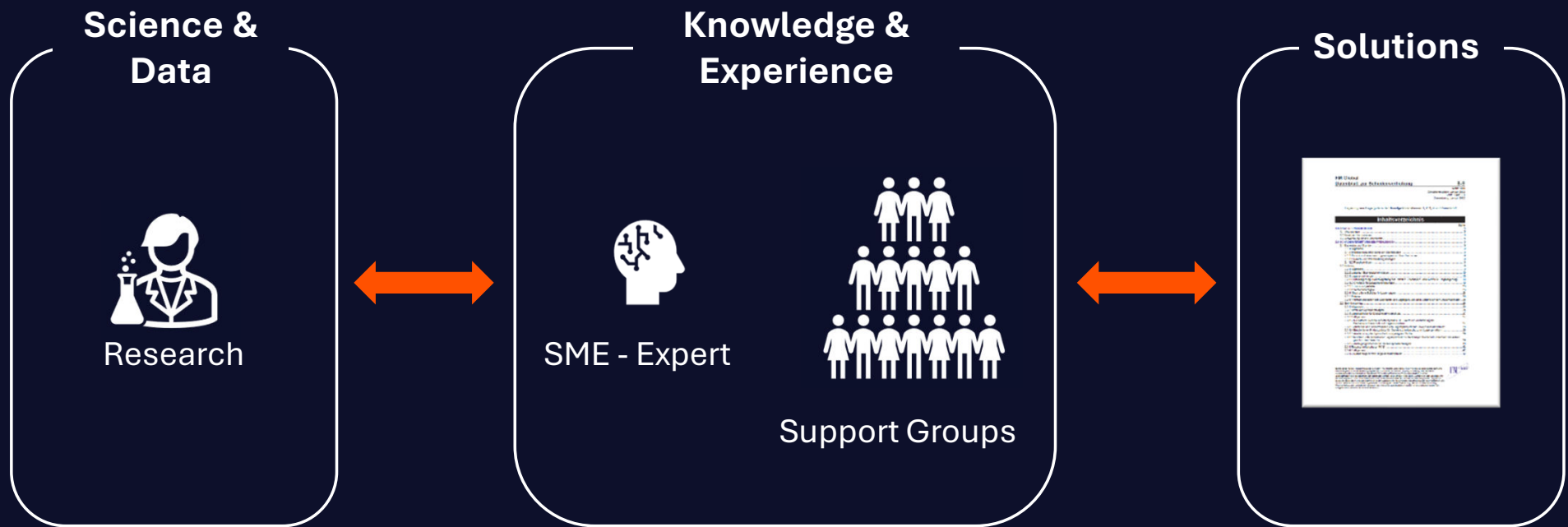
Unvented

Vented





Datasheets – are not static!



State of the art solutions

Summary

- FM – specialty Insurance company
- Research based solutions
- Datasheets – state of the art
- Accepted by regulatory guidance

FM Property Loss Prevention Data Sheets

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FM Loss Prevention Datasheets

- Structure and overview Datasheets
- Setup each Datasheet

FM Property Loss Prevention Data Sheets

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2 Sprinklers

3 Water Supply

4 Extinguishing Equipment

5 Electrical

6 Boilers and Industrial Heating
Equipment

7 Hazards

8 Storage

9 Miscellaneous

10 Human Factors

11 Systems Instrumentation and Control

12 Pressure Vessels

13 Mechanical

15 Welding

17 B&M Miscellaneous

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CONSTRUCTION	
1-0	Safeguards During Construction, Alteration, and Demolition 20 pp. 07/23 (Interim Revision)
1-2	Earthquakes 68 pp. 01/24 (Interim Revision)
1-3	High-Rise Buildings 18 pp. 07/12 (Changes to Recommendations)
1-4	Fire Tests 29 pp. 04/19 (Full Revision)
1-6	Cooling Towers 31 pp. 04/20 (Completely Revised)
1-9	Roof Anchorage for Older, Wood-Roofed Buildings 14 pp. 02/20 (Full Revision)
1-10	Interaction of Sprinklers, Smoke and Heat Vents, and Draft Curtains 13 pp. 01/11 (Rewritten)
1-11	Fire Following Earthquake 38 pp. 04/25 (Interim Revision)
1-12	Ceilings and Concealed Spaces 11 pp. 04/25 (Interim Revision)
1-15	Roof-Mounted Solar Photovoltaic Panels 33 pp. 10/25 (Interim Revision)
1-17	Reflective Wall and Ceiling Insulation 9 pp. 01/23 (Completely Revised)
1-20	Protection Against Exterior Fire Exposure 12 pp. 04/25 (Full Revision)
1-21	Fire Resistance of Building Assemblies 50 pp. 01/12 (Changes to Recommendations)
1-22	Maximum Foreseeable Loss 11 pp. 01/28 (Interim Revision)
1-24	Protection Against Liquid Damage in Light-Hazard Occupancies 24 pp. 07/24 (Interim Revision)
1-28	Wind Design 98 pp. 10/25 (Interim Revision)
1-29	Roof Deck Securement and Above-Deck Roof Components 50 pp. 07/22 (Interim Revision)
1-31	Panel Roof Systems 20 pp. 10/24 (Interim Revision)
1-33	Safeguarding Torch-Applied Roof Installations 7 pp. 10/17
1-34	Hail Damage 24 pp. 10/25 (Interim Revision)
1-35	Vegetative Roof Systems, Occupied Roof Areas and Decks 47 pp. 10/25 (Interim Revision)
1-36	Mass Engineered Timber 11 pp. 07/23 (New)
1-40	Flood 69 pp. 10/25 (Interim Revision)
1-42	Maximum Foreseeable Loss Limiting Factors 125 pp. 04/25 (Interim Revision)
1-44	Damage-Limiting Construction 26 pp. 10/24 (Interim Revision)

1-49	Perimeter Flashing 34 pp. 10/25 (Interim Revision)
1-52	Field Verification of Roof Wind Uplift Resistance 29 pp. 10/24 (Interim Revision)
1-53	Anechoic Chambers 26 pp. 04/25 (Interim Revision)
1-54	Roof Loads and Drainage 115 pp. 10/24 (Interim Revision)
1-56	Cleanrooms 25 pp. 04/20 (Interim Revision)
1-57	Plastics in Construction 35 pp. 04/25 (Interim Revision)
1-59	Fabric and Membrane Structures 18 pp. 04/21 (Completely Revised)
1-62	Cranes 36 pp. 07/23 (Interim Revision)

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5 Electrical

6 Boilers and Industrial Heating Equipment

7 Hazards

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15 Welding

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SPRINKLERS	
2-0	Installation Guidelines for Automatic Sprinklers 187 pp. 04/25 (Interim Revision)
2-1	Corrosion in Automatic Sprinkler Systems 21 pp. 07/22 (Interim Revision)
2-8	Earthquake Protection for Water-Based Fire Protection Systems 92 pp. 04/25 (Interim Revision)
2-81	Fire Protection System Inspection, Testing and Maintenance 74 pp. 10/25 (Interim Revision)
2-89	Pipe Friction Loss Tables 64 pp. 01/01
WATER SUPPLY	
3-0	Hydraulics of Fire Protection Systems 65 pp. 03/10 (Rewritten)
3-1	Tanks and Reservoirs for Interconnected Fire Service and Public Mains 4 pp. 04/25 (Reaffirmed)
3-2	Water Tanks for Fire Protection 108 pp. 07/22 (Interim Revision)
3-4	Embankment-Supported Fabric Tanks 6 pp. 07/22 (Interim Revision)
3-6	Lined Earth Reservoirs for Fire Protection 4 pp. 07/22 (Interim Revision)
3-7	Fire Protection Pumps 48 pp. 04/25 (Interim Revision)
3-10	Private Fire Service Mains and Connections 36 pp. 04/25 (Full Revision)
3-11	Flow and Pressure Regulating Devices for Fire Protection Service 15 pp. 01/23 (Interim Revision)
3-26	Fire Protection for Nonstorage Occupancies 26 pp. 04/25 (Interim Revision)
3-29	Reliability of Fire Protection Water Supplies 5 pp. 04/21 (Interim Revision)

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HAZARDS	
7-0	Causes and Effects of Fires and Explosions 22 pp. 04/13 (Changes to Supporting Information)
7-1	Fire Protection for Textile Mills 42 pp. 07/23 (Interim Revision)
7-2	Waste Solvent Recovery 11 pp. 04/25 (Reaffirmed)
7-3	Flight and Other Simulators 9 pp. 01/21 (Completely Revised)
7-4	Paper Machines and Pulp Dryers 41 pp. 10/24 (Interim Revision)
7-6	Plastic and Plastic-Lined Tanks 10 pp. 04/17
7-7	Semiconductor Fabrication Facilities 76 pp. 04/25 (Full Revision)
7-9	Dip Tanks and Flow/Hot Coolers 15 pp. 02/25 (Interim Revision)
7-10	Wood Processing and Woodworking Facilities 33 pp. 05/10 (Minor Editorial Changes)
7-11	Conveyors 22 pp. 04/25 (Interim Revision)
7-12	Mining and Mineral Processing 54 pp. 07/22 (Interim Revision)
7-13	Mechanical Refrigeration 20 pp. 01/18 (Completely revised)
7-14	Fire Protection for Chemical Plants 44 pp. 07/19 (Interim revision)
7-15	Gauges 5 pp. 04/25 (Interim Revision)
7-17	Explosion Protection Systems 19 pp. 01/12 (Minor Editorial Changes)
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7-20	Oil Cookers 14 pp. 01/23 (Interim Revision)
7-21	Rolling Mills 18 pp. 07/23 (Interim Revision)
7-24	Blowing Agents 9 pp. 01/12 (Minor Editorial Changes)
7-25	Blast Furnace Ironmaking and Basic Oxygen Steelmaking 12 pp. 04/25 (Interim Revision)
7-26	Glass Manufacturing 25 pp. 04/25 (Interim Revision)
7-27	Spray Application of Ignitable and Combustible Materials 31 pp. 04/18 (Interim Revision)
7-28	Energetic Materials 15 pp. 01/21 (Completely Revised)
7-29	Ignitable Liquid Storage in Portable Containers 157 pp. 04/25 (Interim Revision)
7-31	Storage of Aerosol Products 67 pp. 07/24 (Interim Revision)
7-32	Ignitable Liquid Operations 62 pp. 01/24 (Interim Revision)
7-33	Molten Metals and Other Materials 36 pp. 04/25 (Interim Revision)
7-35	Air Separation: Oxygen and Nitrogen 22 pp. 04/21 (Completely Revised)
7-36	Pharmaceutical Operations 27 pp. 07/21 (Interim Revision)
7-37	Cutting Fluids 10 pp. 01/21 (Completely Revised)
7-39	Material Handling Vehicles 11 pp. 04/25 (Full Revision)
7-40	Heavy Duty Mobile Equipment 20 pp. 01/22 (Completely Revised)
7-41	Heat Treating of Materials Using Oil Quenching and Molten Salt Baths 14 pp. 01/22 (Interim Revision)
7-42	Vapor Cloud Explosions 16 pp. 07/19 (Full Revision)
7-43	Process Safety 25 pp. 07/18
7-45	Safety Controls, Alarms, and Interlocks 26 pp. 07/23 (Interim Revision)
7-46	Chemical Reactors and Reactions 54 pp. 10/25 (Interim Revision)
7-48	Disposal of Waste Materials 12 pp. 05/00 (Content Reorganization)

7-46	Chemical Reactors and Reactions 54 pp. 10/25 (Interim Revision)
7-48	Disposal of Waste Materials 12 pp. 05/00 (Content Reorganization)
7-49	Emergency Venting of Vessels 31 pp. 10/25 (Interim Revision)
7-50	Compressed Gases in Portable Cylinders and Bulk Storage 19 pp. 07/23 (Interim Revision)
7-51	Acetylene 16 pp. 01/12 (Minor Editorial Changes)
7-54	Natural Gas and Gas Piping 17 pp. 01/23 (Interim Revision)
7-55	Liquefied Petroleum Gas (LPG) Storage in Stationary Installations 34 pp. 10/13 (Reaffirmed)
7-58	Chlorine Dioxide 14 pp. 04/25 (Reaffirmed)
7-59	Inerting and Purging of Vessels and Equipment 16 pp. 01/22 (Completely Revised)
7-61	Facilities Processing Radioactive Materials 14 pp. 04/25 (Reaffirmed)
7-64	Aluminum Smelting 17 pp. 04/25 (Interim Revision)
7-72	Reformer and Cracking Furnaces 28 pp. 01/22 (Interim Revisions)
7-74	Distilleries 10 pp. 01/10 (Minor Editorial Changes)
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7-76	Combustible Dusts 70 pp. 10/24 (Completely Revised)
7-77	Testing of Engines and Accessory Equipment 17 pp. 01/24 (Interim Revision)
7-78	Industrial Exhaust Systems 29 pp. 10/24 (Interim Revision)
7-79	Fire Protection for Gas Turbines and Electric Generators 43 pp. 07/25 (Interim Revision)
7-80	Organic Peroxides and Oxidizing Materials 37 pp. 07/20 (Completely Revised)
7-83	Drainage and Containment Systems for Ignitable Liquids 24 pp. 01/15 (Interim Revision)
7-85	Combustible and Reactive Metals 18 pp. 04/25 (Interim Revision)
7-86	Cellulose Nitrate 4 pp. 04/25 (Reaffirmed)
7-88	Outdoor Ignitable Liquid Storage Tanks 28 pp. 10/20 (Interim Revision)
7-89	Ammonium Nitrate and Mixed Fertilizers Containing Ammonium Nitrate 16 pp. 01/21 (Completely Revised)
7-91	Hydrogen 22 pp. 10/25 (Interim Revision)
7-92	Ethylene Oxide 19 pp. 4/13 (Minor Editorial Changes)
7-93	Aircraft Hangars, Aircraft Manufacturing and Assembly Facilities, and Protection of Aircraft Interiors During Assembly 27 pp. 07/22 (Interim Revision)
7-95	Compressors 20 pp. 10/24 (Interim Revision)
7-96	Printing Plants 29 pp. 07/23 (Interim Revision)
7-97	Metal Cleaning 10 pp. 01/22 (Interim Revision)
7-98	Hydraulic Fluids 12 pp. 01/21 (Completely Revised)
7-99	Heat Transfer Fluid System 35 pp. 01/22 (Interim Revision)
7-101	Fire Protection for Steam Turbines and Electric Generators 46 pp. 07/22 (Interim Revision)
7-103	Turpentine Recovery in Pulp and Paper Mills 5 pp. 04/25 (Reaffirmed)
7-104	Metal Treatment Processes 6 pp. 01/13 (New)
7-106	Ground-Mounted Solar Photovoltaic Power 26 pp. 10/24 (Interim Revision)
7-108	Slime 22 pp. 04/14 (New)
7-109	Fired Thermal Electric Power Generation Facilities 15 pp. 07/24 (Interim Revision)
7-110	Industrial Control Systems 22 pp. 07/24 (Interim Revision)

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5 Electrical

6 Boilers and Industrial Heating Equipment

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8-1	Commodity Classification 23 pp. 10/25 (Interim Revision)
8-3	Rubber Tire Storage 20 pp. 01/09 (Minor Editorial Changes)
8-7	Baled Fiber Storage 11 pp. 04/17
8-9	Storage of Class 1, 2, 3, 4 and Plastic Commodities 100 pp. 07/25 (Interim Revision)
8-10	Coal and Charcoal Storage 7 pp. 01/03 (Addition to Recommendations)
8-18	Storage of Hanging Garments 28 pp. 10/19 (Interim Revision)
8-21	Roll Paper Storage 21 pp. 10/25 (Interim Revision)
8-22	Storage of Baled Waste Paper 4 pp. 10/13 (Interim Revision)
8-23	Rolled Nonwoven Fabric Storage 31 pp. 01/15 (Completely Rewritten)
8-24	Idle Pallet Storage 6 pp. 01/15 (Interim Revision)
8-27	Storage of Wood Chips 6 pp. 05/00 (Content Reorganization)
8-28	Pulpwood and Outdoor Log Storage 12 pp. 05/00 (Content Reorganization)
8-30	Storage of Carpets 8 pp. 04/25 (Reaffirmed)
8-33	Carousel Storage and Retrieval Systems 18 pp. 04/25 (Interim Revision)
8-34	Protection for Automatic Storage and Retrieval Systems 119 pp. 07/24 (Interim Revision)

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10-0	The Human Factor of Property Conservation 10 pp. 04/19 (Interim Revision)
10-1	Pre-Incident and Emergency Response Planning 31 pp. 01/23 (Interim Revision)
10-3	Hot Work Management 30 pp. 07/21 (Interim Revision)
10-4	Contractor Management 7 pp. 01/24 (Completely Revised)
10-5	Disaster Recovery Planning 8 pp. 04/25 (Reorganized)
10-6	Protection Against Arson and Other Incendiary Fires 14 pp. 04/25 (Reaffirmed)
10-7	Fire Protection Impairment Management 11 pp. 10/25 (Interim Revision)
10-8	Operators 12 pp. 01/19 (Interim Revision)

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Roof:

- Steeldeck, plastic insulation, suspended ceiling, skylights & light band, PV panels

Manufacturing:

- Plastic presses process
- In process product storage
- Oil & solvent storage
- Hydraulic presses
- Dust

Warehouse:

- Rack and shelf storage
- ASRS-system
- Ignitable Liquid storage room

Exposures:

- Neighboring building
- Yard storage

Natural Hazard:

- EQ-zone

Human Element:

- Sprinkler testing/maintenance
- Red Tag impairment / Hot work

example simplified
plastic manufacturing & warehouse site

Structure of FM Data Sheets – SECTIONS: example (simplified)

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Dataheet	construction	Sprinkler design	Sprinkler installation	Sprinkler ITM interlocks
1-28 roof deck	X	X		
1-12 ceilings etc	X	X		
1-15 PV panels	X	X	X	
1-57 plastics	X	X	X	
2-0 AS installation	X	X	X	

Roof:

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Structure of FM Data Sheets – SECTIONS: example (simplified)

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Dataheet	construction	Sprinkler design	Sprinkler installation	Sprinkler ITM interlocks
2-0 AS installation	X	X	X	
3-7 pumps & 3-2 tanks	X	X	X	
3-26 non-storage Occ.	X	X	X	
8-9 storage	X	X	X	
7-98 hydraulic fluids	X	X	X	X
7-29 IL storage 7-32 IL handling, 7-32A	X	X	X	X
7-76 dust 7-78 ind. Exhaust systems	X	X	X	X

Roof:

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Manufacturing:

- Plastic presses process
- In process product storage
- Oil & solvent storage
- Hydraulic presses
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Dataheet			Sprinkler design	Sprinkler installation	Sprinkler ITM interlocks
2-0 AS installation	X		X	X	
3-7 pumps & 3-2 tanks	X		X	X	
8-9 storage	X		X	X	
8-34 ASRS	X		X	X	X
7-29 IL storage 7-32 IL handling, 7-32A	X		X	X	X

Roof:

- Steeldeck, plastic insulation, suspended ceiling, skylights & light band, PV panels

Manufacturing:

- Plastic presses process
- In process product storage
- Oil & solvent storage
- Hydraulic presses
- Dust

Warehouse:

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- Yard storage

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Human Element:

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- Red Tag impairment / Hot work

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Dataheet	construction	Sprinkler design	Sprinkler installation	Sprinkler ITM Interlocks
2-0 AS installation	X	X	X	
3-7 pumps & 3-2 tanks	X	X	X	
1-20 protection external fier	X	X	X	
1-22 MFL	X	X	X	
8-34 idle pallet storage	X	X	X	

Roof:

- Steeldeck, plastic insulation, suspended ceiling, skylights & light band, PV panels

Manufacturing:

- Plastic presses process
- In process product storage
- Oil & solvent storage
- Hydraulic presses
- Dust

Warehouse:

- Rack and shelf storage
- ASRS-system
- Ignitable Liquid storage room

Exposures:

- Neighboring building
- Yard storage

Natural Hazard:

- EQ-zone

Human Element:

- Sprinkler testing/maintenance
- Red Tag impairment / Hot work



Structure of FM Data Sheets – SECTIONS: example (simplified)

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4 Extinguishing Equipment

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Dataheet	construction	Sprinkler design	Sprinkler installation	Sprinkler ITM Interlocks
1-2 EQ	X	X	X	X
2-0 AS installation	X	X	X	
2-8 EQ AS	X	X	X	
3-7 pumps & 3-2 tanks	X	X	X	
Dataheet	construction	Sprinkler design	Sprinkler installation	Sprinkler ITM Interlocks
2-81 AS & pump testing			X	X
10-7 impairment handling			X	X
10-1 pre-incident & ERP			X	X
10-3 Hot work	X		X	X
10-4 contractor man				X



Roof:

- Steeldeck, plastic insulation, suspended ceiling, skylights & light band, PV panels

Manufacturing:

- Plastic presses process
- In process product storage
- Oil & solvent storage
- Hydraulic presses
- Dust

Warehouse:

- Rack and shelf storage
- ASRS-system
- Ignitable Liquid storage room

Exposures:

- Neighboring building
- Yard storage

Natural Hazard:

- EQ-zone

Human Element:

- Sprinkler testing/maintenance
- Red Tag impairment / Hot work

FM Loss Prevention Datasheets

- Structure and overview Datasheets
- Setup each Datasheet

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STORAGE OF CLASS 1, 2, 3, 4 AND PLASTIC COMMODITIES

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2.0 Recommendations

- Construction & Location
- Occupancy
- Protection

3.0 Support for Recommendations

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Structure of FM Data Sheets

1.0 Scope

Tells you what this DS is to be applied for, exclusions and how to use the DS.

2.0 Recommendations

- Construction & Location
- Occupancy
- Protection

3.0 Support for Recommendations

Appendix: Glossary of Terms

1.0 SCOPE

This property loss prevention data sheet provides fire protection recommendations for the storage of Class 1, 2, 3, 4, and plastic commodities maintained in rack, solid-piled, palletized, shelf, or bin-box storage arrangements. Apply this data sheet when (1) Class 1, 2 or 3 commodities are stored higher than 10 ft (3.0 m), or (2) Class 4 or plastic commodities are stored higher than 6 ft (1.8 m). Where Class 1, 2, or 3 commodities will be stored up to a maximum height of 10 ft (3.0 m), or Class 4 or plastic commodities will be stored up to a maximum height of 6 ft (1.8 m), this is considered "low-piled storage". See Data Sheet 3-26, *Fire Protection for Nonstorage Occupancies*, for the recommended protection designs for these given commodities and storage heights.

Use the applicable occupancy-specific data sheet (see Appendix A for definition) when storage consists of commodity hazards other than Class 1, 2, 3, 4 or plastics.

See Data Sheet 8-1, *Commodity Classification*, for guidelines on how to classify individual commodities; see Section 2.2.2 for information on how to determine an overall commodity rating for a given storage area.

Refer to FM Global Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*, for installation guidelines for the sprinklers listed in this data sheet, as well as their compatibility with the facility's construction features.

The recommendations in Data Sheet 8-9 are intended for the design of new automatic sprinkler systems, or existing systems that are to be modified. To evaluate existing automatic sprinkler systems, or to determine whether new protection options based on recently FM Approved products and/or fire testing are a viable option to help lower their risk of loss, clients of FM Global can contact their local FM Global servicing office.

The fire protection recommendations in this data sheet are based on the results of full-scale fire testing, loss experience, and/or engineering judgment. Not every storage arrangement or protection option has been tested, nor has every potential solution been identified. If FM Global data sheets exist that address the specific occupancy, refer to those data sheets for further guidance.

Refer to the applicable occupancy-specific data sheet for loss prevention recommendations related to the following subjects, which are not covered in this data sheet:

Structure of FM Data Sheets

1.0 Scope

2.0 Recommendations



- Construction & Location
- Occupancy
- Protection

3.0 Support for Recommendations

Appendix: Glossary of Terms

Gives you all the info needed to have the hazard well protected or eliminated. There is more than just the protection especially for special hazards.

2.1.2 Steel Column Protection

Adhering to the design guidelines in this data sheet eliminates the need for both building column and overhead steel protection.

2.1.3 Heat and Smoke Venting and Draft Curtains

2.1.3.1 Heat and Smoke Venting

See Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*, for recommendations related to the use of heat and smoke venting in the presence of Storage sprinklers.

2.1.3.2 Draft Curtains

See Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*, for recommendations related to the use of draft curtains in the presence of Storage sprinklers.

2.2 Occupancy

2.2.1 General

2.2.1.1 Storage arrangements covered in this data sheet include solid-piled, palletized, shelf, bin-box, or single-row, double-row, or multiple-row racks. Within this data sheet, the design guidelines for solid-piled, palletized, shelf, or bin-box storage arrangements are consolidated into the same protection table for a given commodity hazard. Similarly, the design guidelines for single-row, double-row, and multiple-row storage racks are consolidated into the same protection table for a given commodity hazard.

Structure of FM Data Sheets

1.0 Scope

2.0 Recommendations

- Construction & Location
- Occupancy
- Protection

3.0 Support for Recommendations

Appendix: Glossary of Terms

3.0 SUPPORT FOR RECOMMENDATIONS

3.1 General

The fire protection recommendations in this data sheet are based on testing, loss experience, and engineering judgment. Not every situation has been tested, nor has every potential solution been identified. Carefully consider all the variables involved when exploring options that differ from those recommended in this data sheet.

3.2 Loss History

Loss experience has shown that when there are no major automatic sprinkler system deficiencies, fires in storage occupancies are controlled by the existing sprinkler system protection arrangement. Major protection deficiencies include inadequate water supplies, closed or partially closed valves, obstructed sprinkler piping, missing sprinklers, and flammable liquid or aerosol protection deficiencies. Protection deficiencies were identified in all storage losses where the fire was uncontrolled.

Note that storage loss experience to date has involved primarily standard-response K5.6 (K80) or K8.0 (K115) sprinklers. Experience with K11.2 (K160) and larger sprinklers is limited due to their relatively recent development.

Some general deductions can be made from a study of rack storage losses (solid-piled/palletized losses have not been studied in similar detail) that occurred in a recent 18-year period, and in which no protection deficiencies were identified. These losses involve standard-response K5.6 (K80) and K8.0 (K115) sprinklers exclusively. The basic findings are as follows:

Additional information and loss examples.

Structure of FM Data Sheets

1.0 Scope

2.0 Recommendations

- Construction & Location
- Occupancy
- Protection

3.0 Support for Recommendations

Appendix: Glossary of Terms

APPENDIX A GLOSSARY OF TERMS

Aisle: A clear space maintained between commodities stored either in racks or on the floor.

Approval Guide: An online resource of FM Approvals that provides a guide to equipment, materials, and services that have been FM Approved for property conservation.

Bin-Box Storage: A storage arrangement that typically consists of solid shelves in combination with solid full-height wooden or metal vertical barriers. There is usually a solid backing for each bin-box storage unit, but this is not always the case. While this type of storage arrangement typically shields direct water application to the burning commodity maintained within each bin-box storage unit, the relatively low tier height between solid shelves coupled with the full-height vertical barriers help to reduce the heat release rate of the fire as well as severely delay its potential for horizontal fire growth.

Clearance: The clear space maintained between the top of storage and the deflector of the sprinkler (ceiling or in-rack) located above it.

Commodity: and material handling aids (e.g., pallets). Data Sheet 8-1, Commodity Classification, contains commodity classification guidelines that are applicable to this data sheet. The purpose of assigning a commodity classification is to allow specification of the proper level of fire protection. A commodity classification is dependent on how the product burns and how the burning product responds to the application of sprinkler discharge. Protection specifications in this data sheet are based on the following categories of commodity:

- Class 1, Class 2, and Class 3 commodity hazards
- Class 4 commodity hazards and Cartoned Unexpanded Plastics
- Cartoned Expanded Plastics
- Uncartoned Unexpanded Plastics

Definition of terms used
in the Datasheet !!!

Thank you. Any questions?



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