



SVENSK STANDARD
SS-EN 12845-2:2024

Fasta släcksystem – Automatiska sprinklersystem – Del 2: Utförande och installation av ESFR- och CMSA-sprinklersystem

Fixed firefighting systems — Automatic sprinkler systems — Part 2: Design and installation of ESFR and CMSA sprinkler systems



sis Svenska
Institutet för
Standarder

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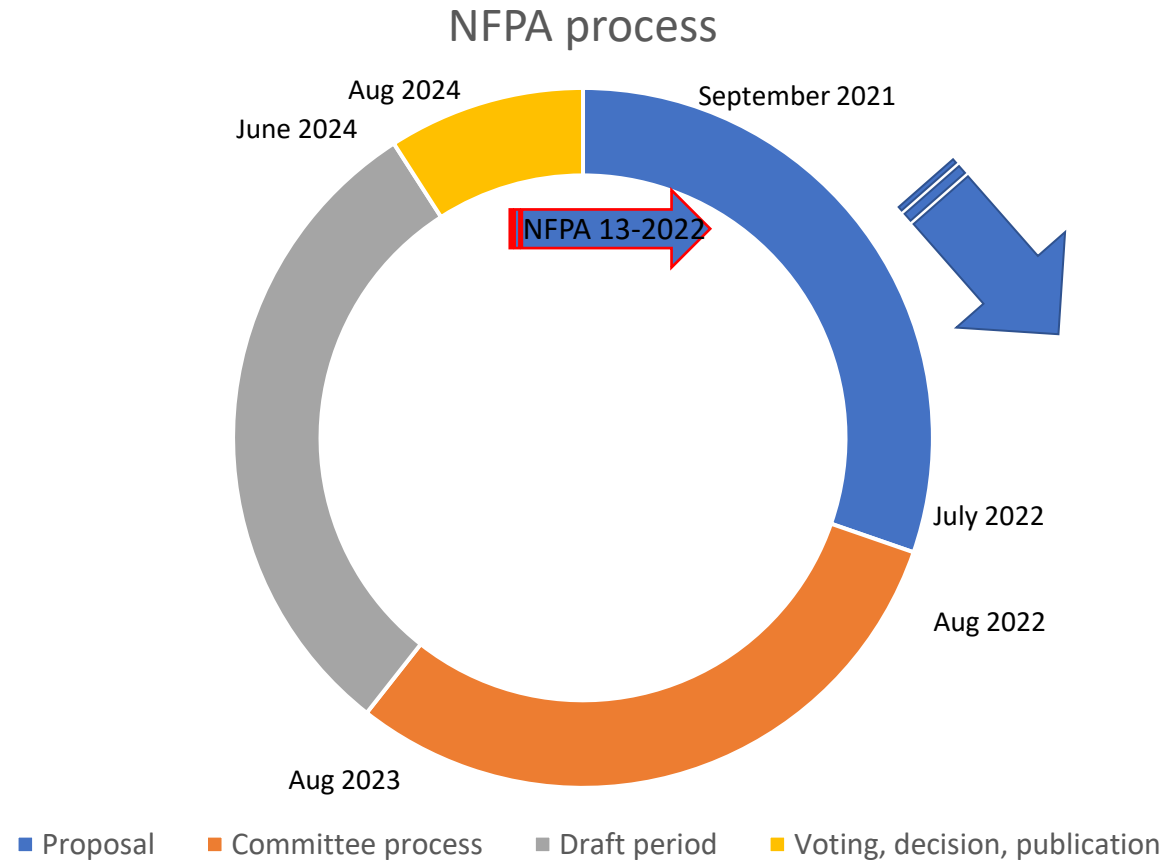
Nya sprinklerstandarder – och kommande sådana också...

Bo Hjorth

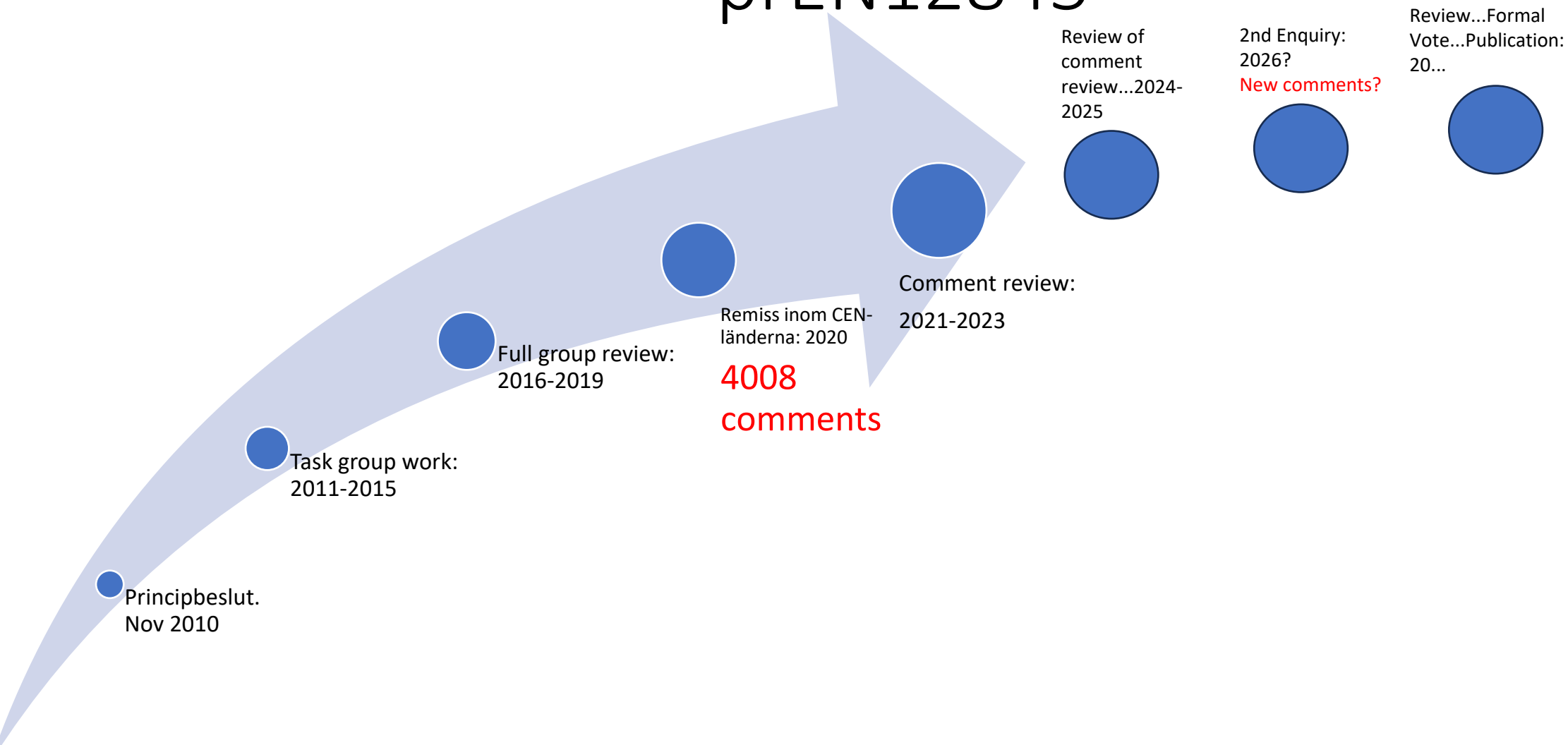
Vad är det som är nytt

- Ett anpassningstillägg för EN12845:2015 + A1:2020
 - EN12845:2020/pr A2:2024
- En ny CEN- standard för ESFR och CMSA
 - EN12845-2
- Nästa utgåva av EN12845
 - prEN12845-1

NFPA 13-2025



prEN12845



EN12845:2020/pr A2:2024

- Anpassning till EN12845-2:2024
- Anpassning till EN17451:2024
- 59 st nya hänvisningar – varav 56 handlar om pumparna
- Har varit ute på remiss under sommaren 2025
- Skickas på Formal Vote under slutet av 2025?



Exempel på ny hänvisning

15. Modification to 10.1. "General"

Replace the whole clause with:

- "Water supplies consisting of pumps shall conform to EN 17451."

19. Modification to 10.6.2 "Suction pipe "

Replace the heading with:

- "Suction pipe of pump set".

Exempel på ny hänvisning

- **59. Modification to Annex P "ESFR sprinkler protection "**
- Replace the whole annex with the following:
- "P.1 General
 - For ESFR sprinkler systems EN 12845-2 shall be applied in connection with this document.
 - For the water supply of ESFR sprinkler systems it is recommended to use three 50 % pump sets in accordance with EN 17451.
- P.2 Class conversion
 - Due to the different hazard classification systems EN 12845-2:2024, Annex A shall be applied.
 - Either the conversion Table A.1 or the flow chart given in Figure A.1."

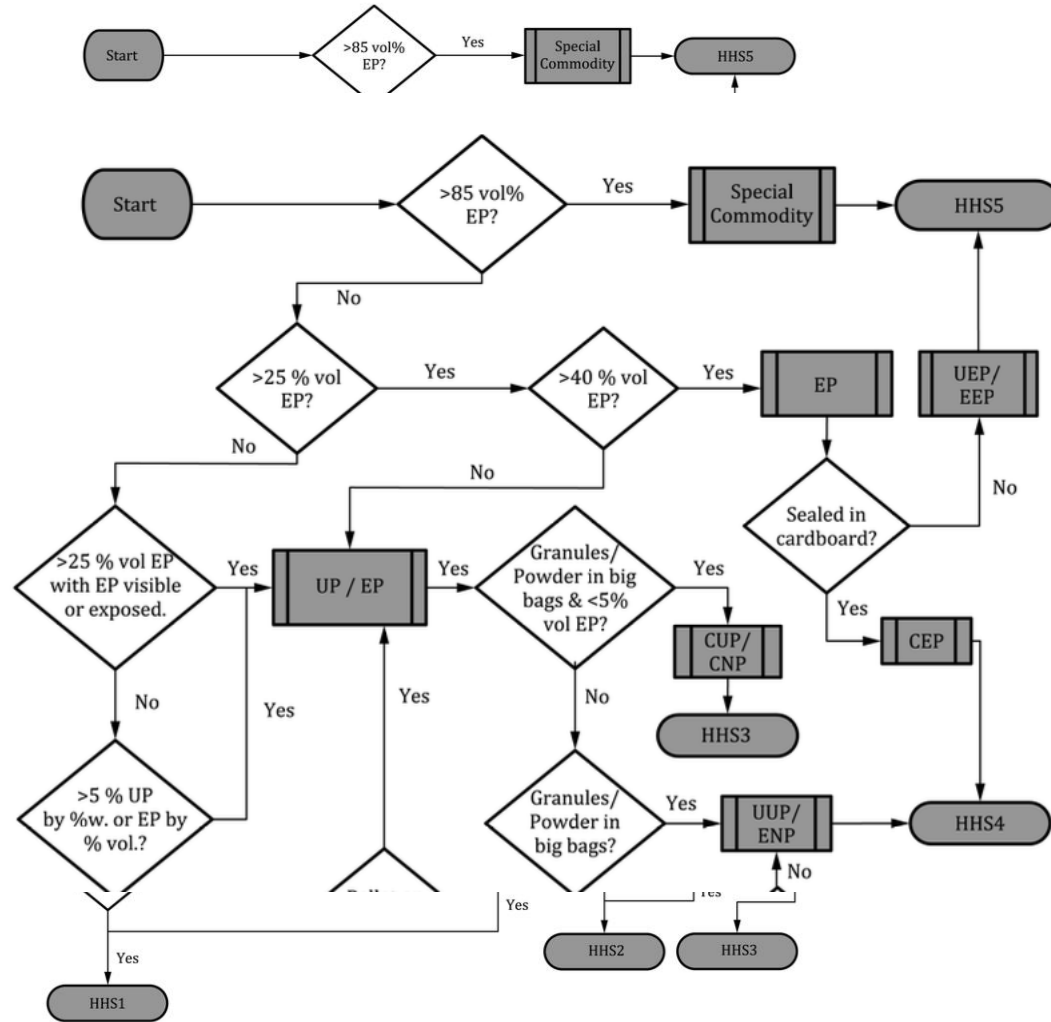
EN12845-2

- Ersätter nuvarande Annex N [CMSA] och Annex P [ESFR]
- Bröts ut från arbete med prEN12845, för att möjliggöra snabbare ändringshantering
- Medförde att ”huvuddokumentet” nu kallas för prEN12845-1
- Liten arbetsgrupp, täta möten – start juli 2023, slutmöte jan 2024.
- Remiss våren 2024, Formal Vote sommaren/hösten 2024.
- Publicering december 2024.

En blandning av NFPA 13 och FM Data sheets

- Enbart baserat på tillgängliga regelverk, inklusive pågående arbeten:
 - NFPA 13-2022
 - Förslag till NFPA 13-2025
 - FM DS 2-0
 - FM DS 8-9
 - FM DS 8-34
- Där kompromiss ej kunnat nås, har alternativa lösningar inkluderats

Godsklassificeringar



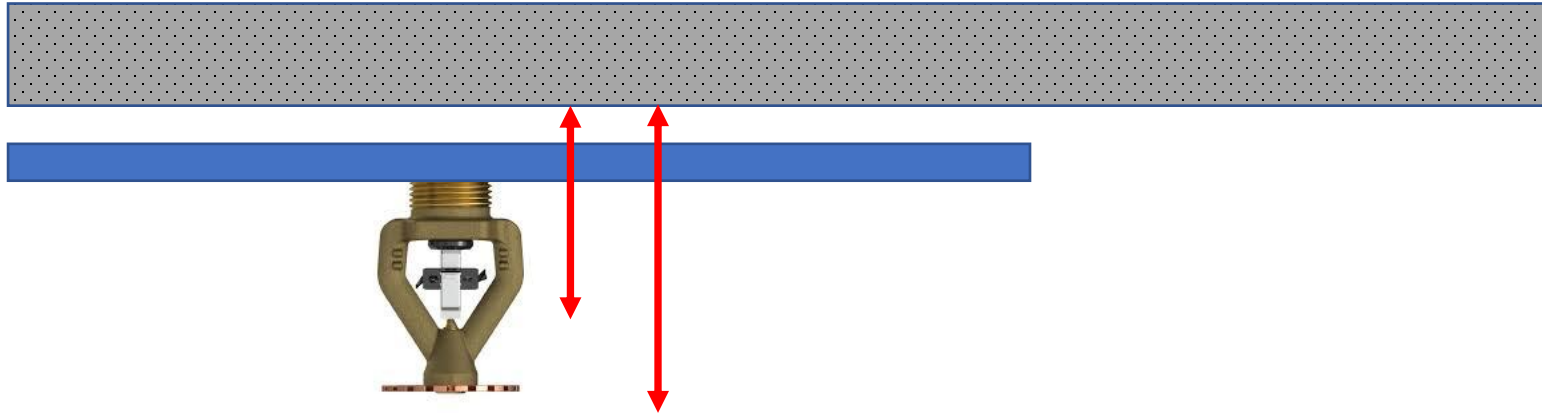
NOTE EP: expanded plastics:

- UP/EP: uncartoned or exposed plastics
- CUP/CNP: cartoned unexpanded plastic or cartoned non-expanded plastics
- CEP: cartoned expanded plastics
- UUP/ENP: uncartoned unexpanded plastic or exposed non-expanded plastics
- UEP/EEP: uncartoned expanded plastic or exposed expanded plastics

Allmänna krav

- ESFR endast för våtrör
- CMSA våtrör eller torrör
- Inga open-top containers, förutom
 - Open-top non-combustible containers can be treated as closed-top non-combustible containers when:
 - all of the storage located below the open-top non-combustible containers is either non-combustible or in non-combustible containers, or
 - all of the open-top non-combustible containers are located on the bottom tier of the storage rack.

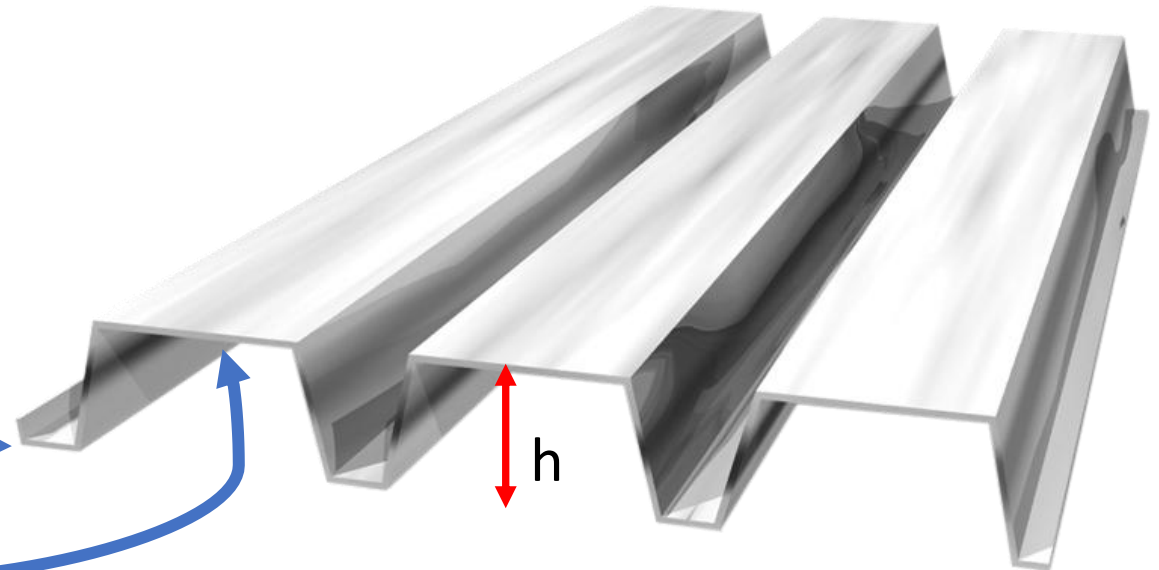
Where is the ceiling?



NOTE: Thermal element –to-ceiling

Om $h < 75 \text{ mm}$

Om $h = 75 \text{ mm}$ eller mer



Distance to ceiling – obstructed or unobstructed construction: ESFR



Pendent: K200 – K240 – **K400**

Minimum 100 mm

Maximum 325 mm



Pendent: K320 - K360 – **K480**

Minimum 100 mm

Maximum 425 mm



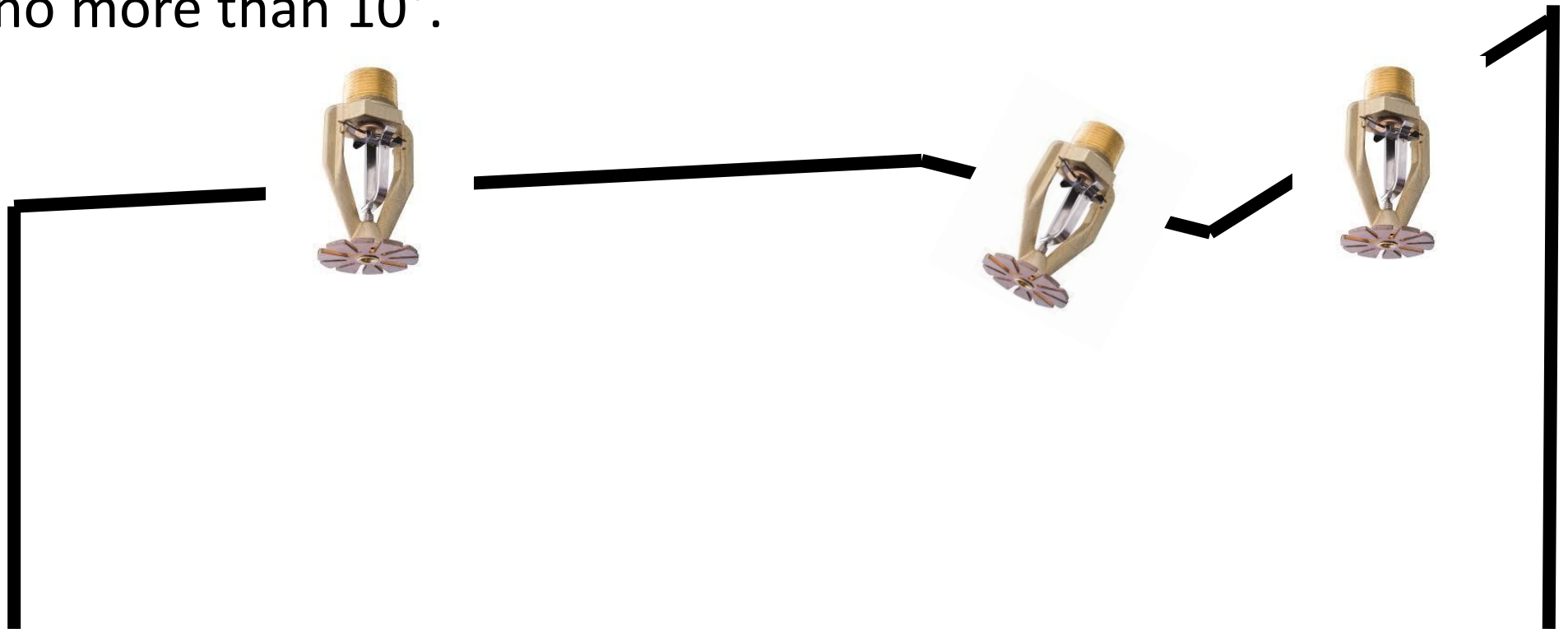
Upright: K200 – K240

Minimum 100 mm

Maximum 325 mm

Sprinkler and the floor

- 5.1.3.6 Sprinkler orientation relative to the floor or pipework
- Sprinklers shall be preferably installed with the deflector parallel to the floor; they may also be installed parallel to the ceiling where the slope is no more than 10° .



Ceiling slope

- 5.2.1 Roof or ceiling slope

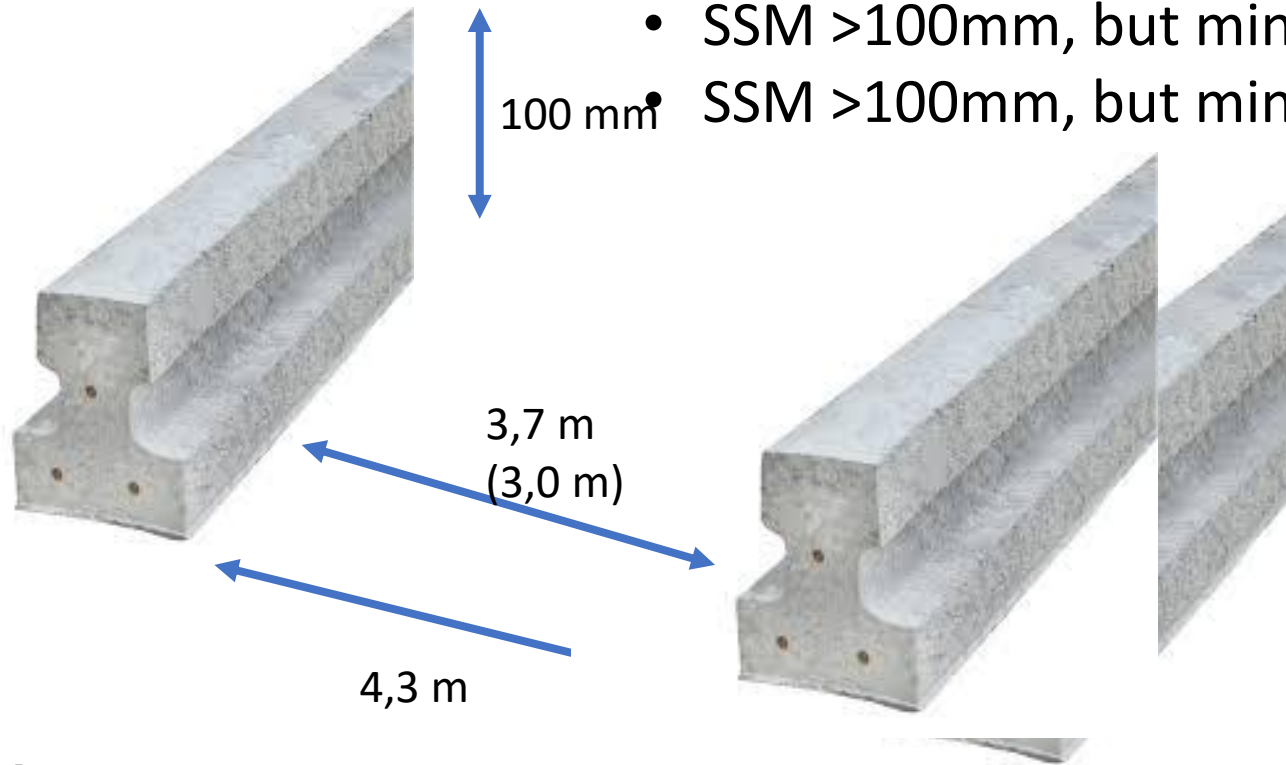
- The maximum ceiling slope shall not be higher than 10° (17,6 %).

If not:

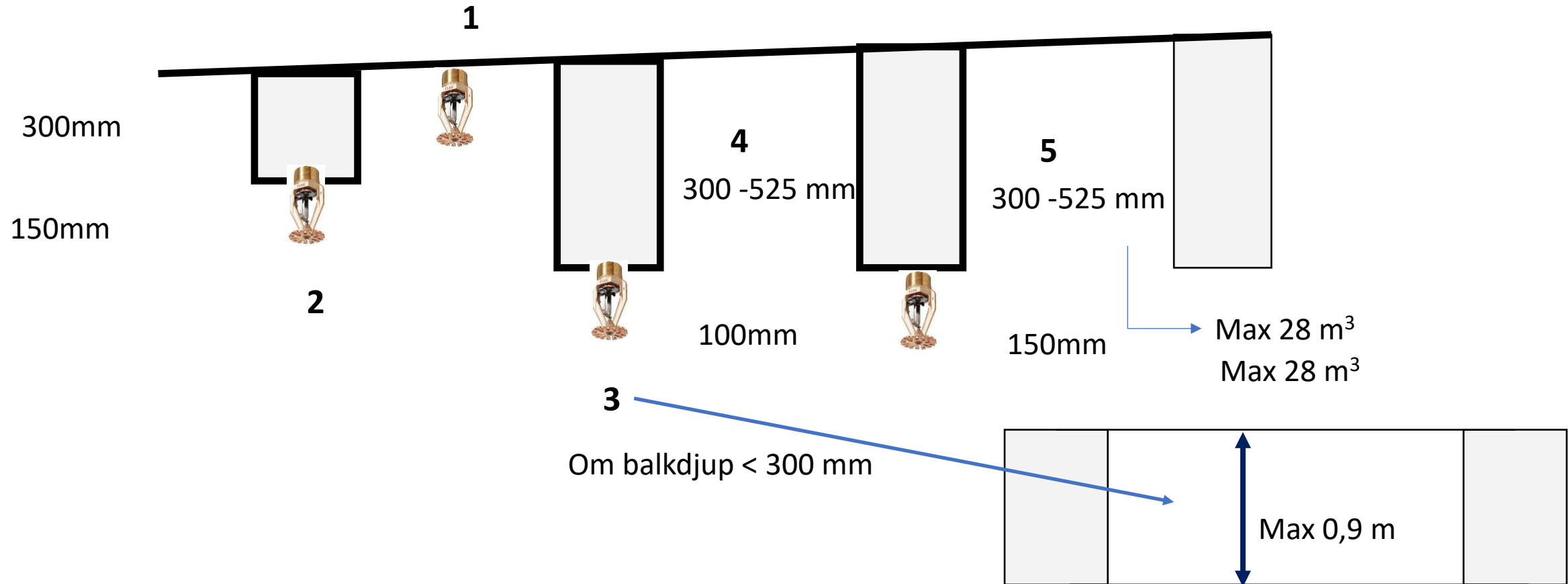
- for areas with only rack storage, provide in-rack sprinklers in accordance with 6.6.2.1 plus an additional level of in-rack sprinklers installed at the top of storage including face sprinklers at the same spacing as the longitudinal sprinklers; or
 - sprinkler system design shall be in accordance with EN 12845.

Unobstructed construction

- Smooth ceiling
- Solid structural members (SSM) maximum 100 mm
- SSM minimum 4,3 m apart
- SSM >100mm, but minimum 3,7 m apart, for $H = 9,0$ m
- SSM >100mm, but minimum 3,0 m apart, for $H > 9,0$ m

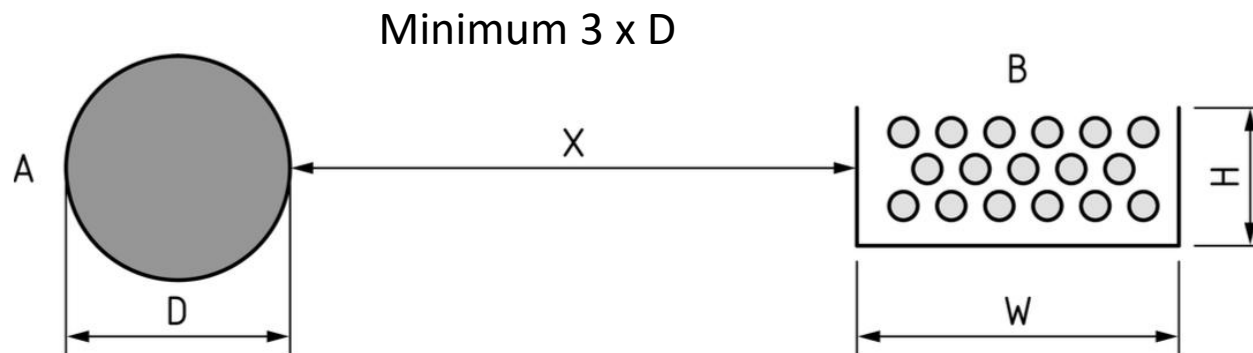


Obstructed constructions och CMSA

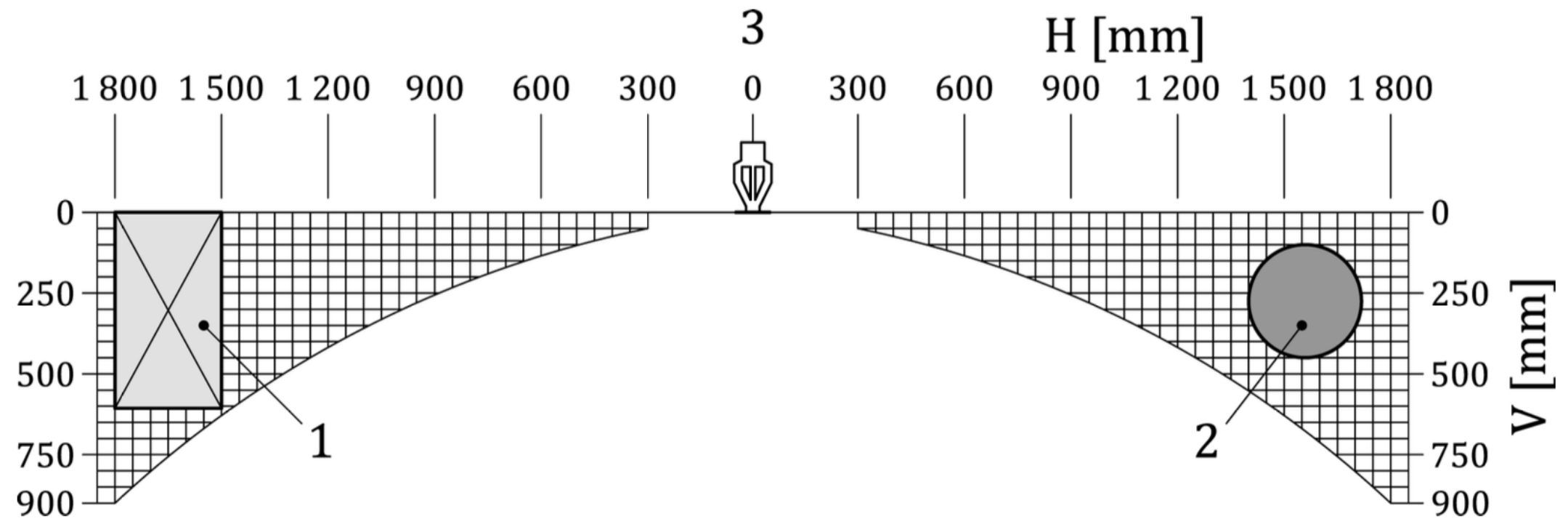


Obstruction criteria

- Bortglömt för ESFR in Annex P
- Nu samma krav för både CMSA och ESFR
- I huvudsak lika som FM DS 2-0 (inklusive grouped obstructions)



Mycket ser ut som i FM DS-20

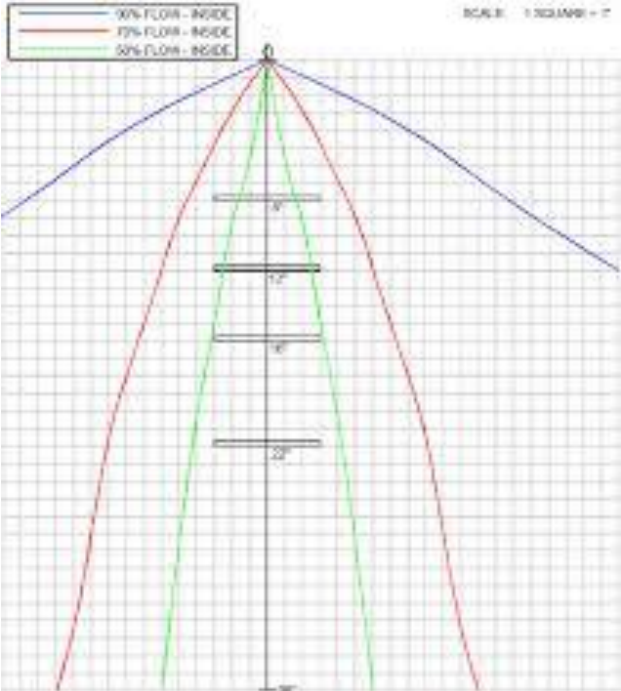
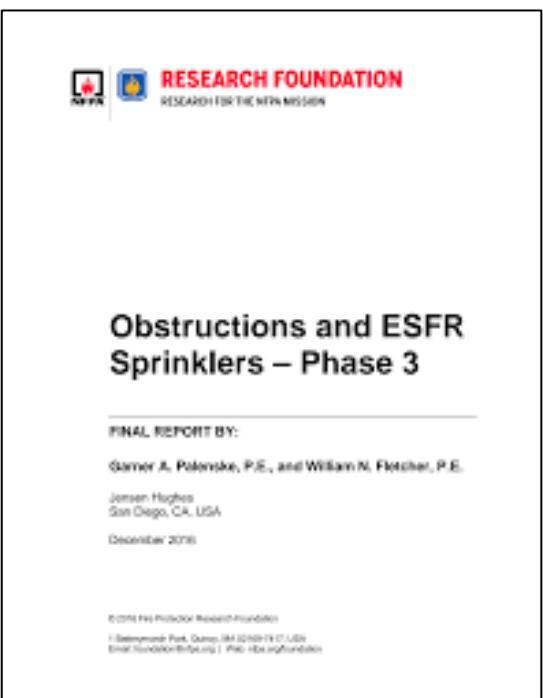
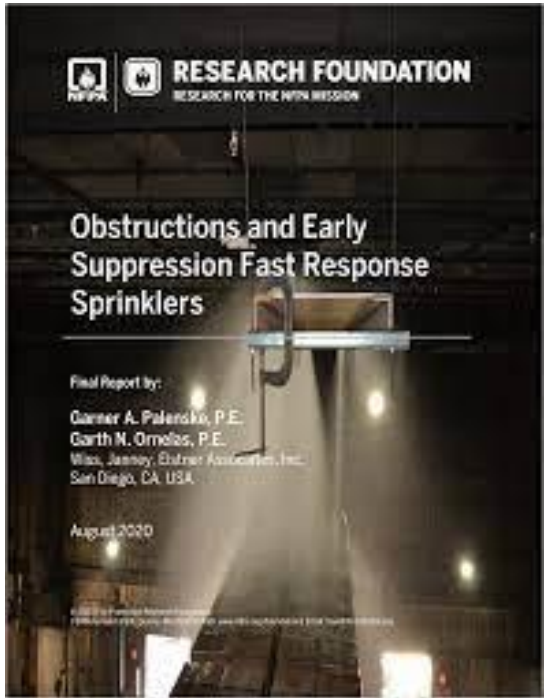
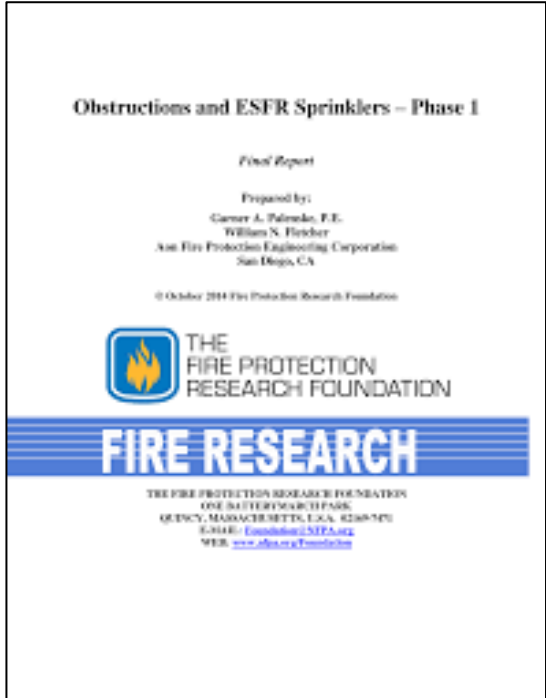




Obstructions that prevent Sprinkler Discharge from Reaching Hazard

- When introducing ESFR K25.2 (NFPA 13-1999, new, much more restrictive obstruction criteria was added





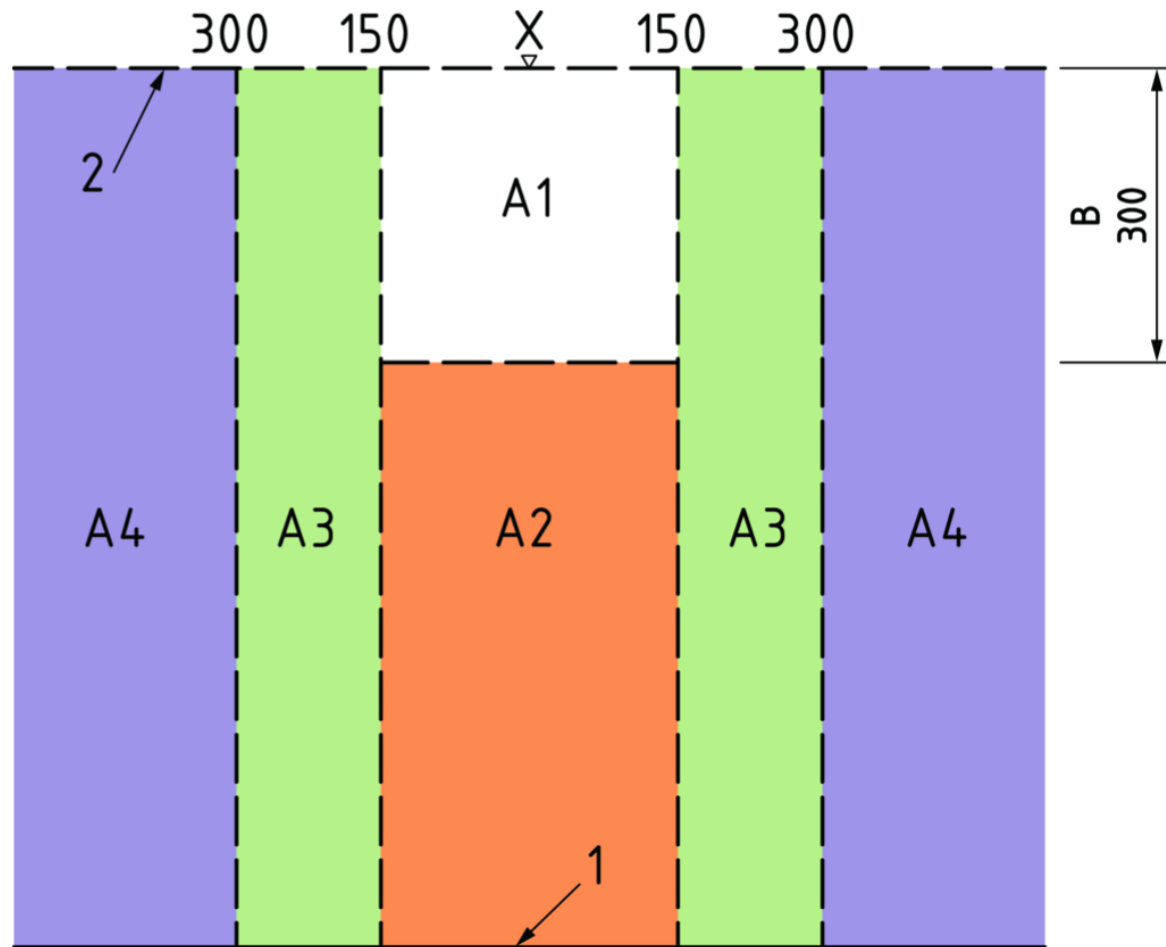
Hinder helt under sprinklerna

Table 4 — Installation guidelines to avoid obstructions to inner core distribution pattern of sprinklers

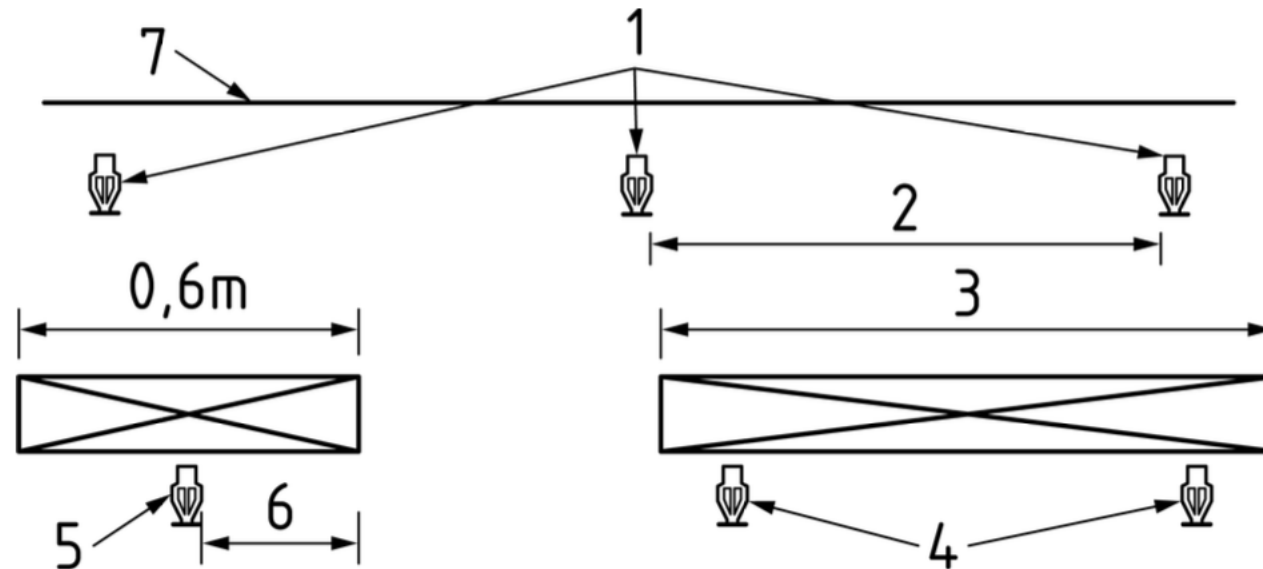
Width of ceiling object located below sprinkler deflector mm	Horizontal distance from nearest edge of object to sprinkler deflector mm	Minimum vertical distance from sprinkler deflector to top of object mm
Up to 38	Up to 150	300
Up to 150	150 to 300	0
300 if the object is ≥ 450 mm above the top of storage 600 if the object is ≥ 900 mm above the top of storage	Over 300	0
> 600	Additional sprinklers needed below object	

Hinder helt under sprinklerna

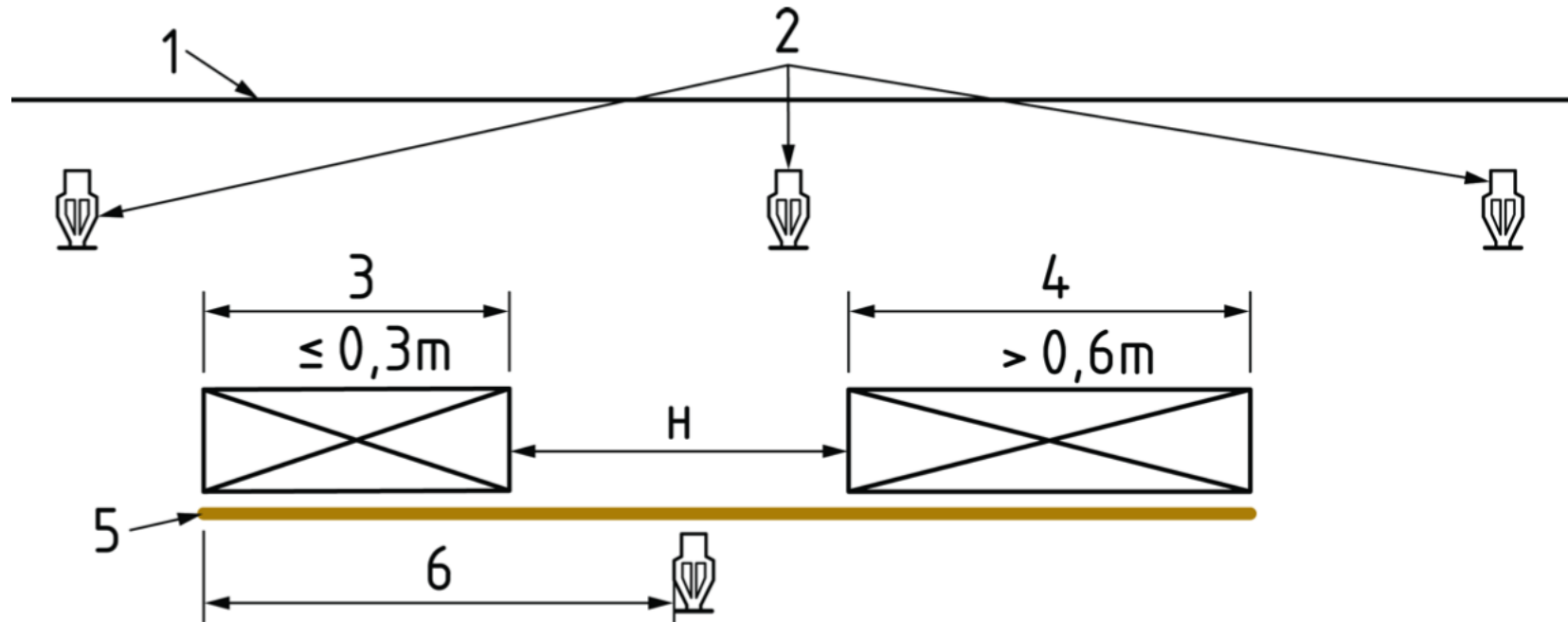
Dimensions in millimetres



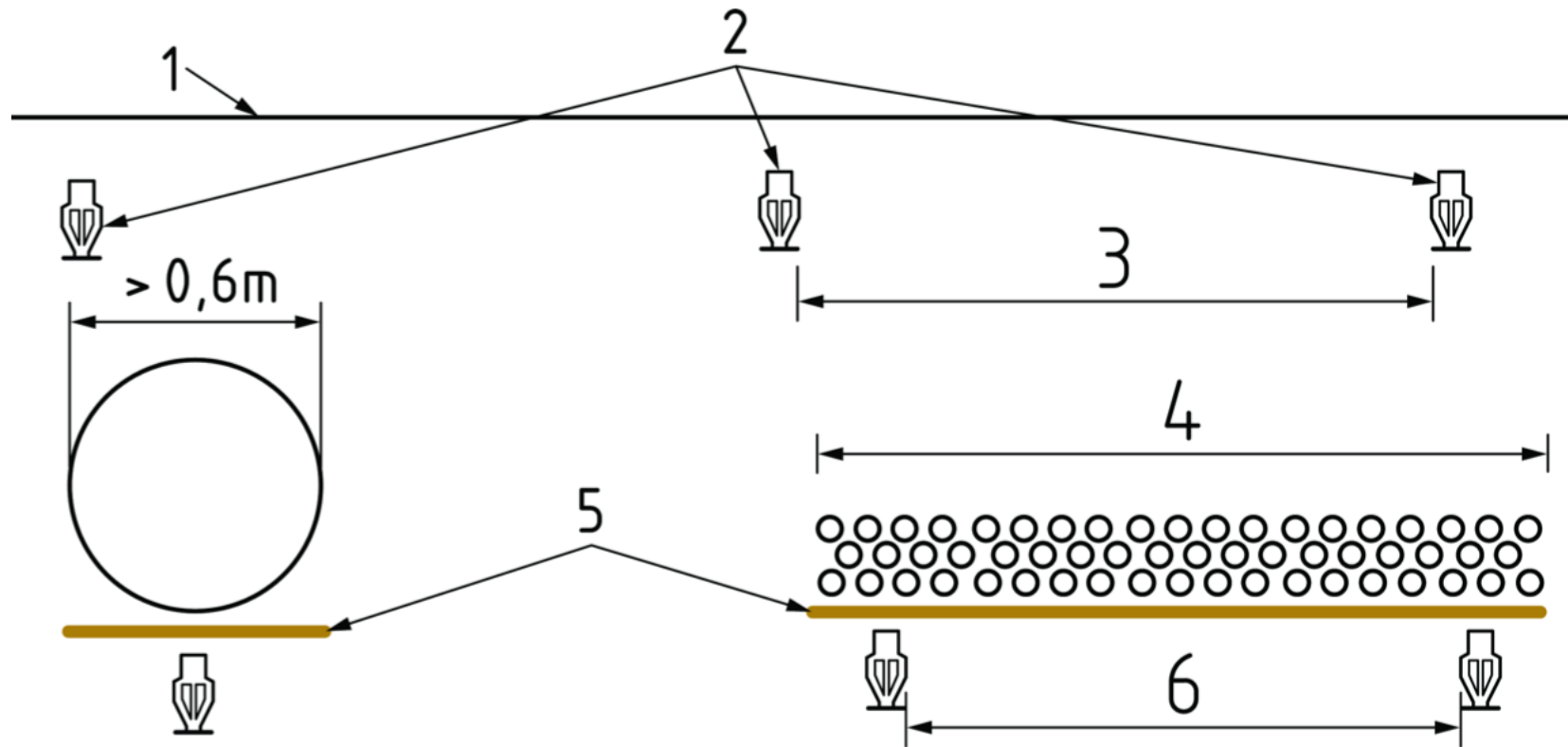
Sprinkler under hinder



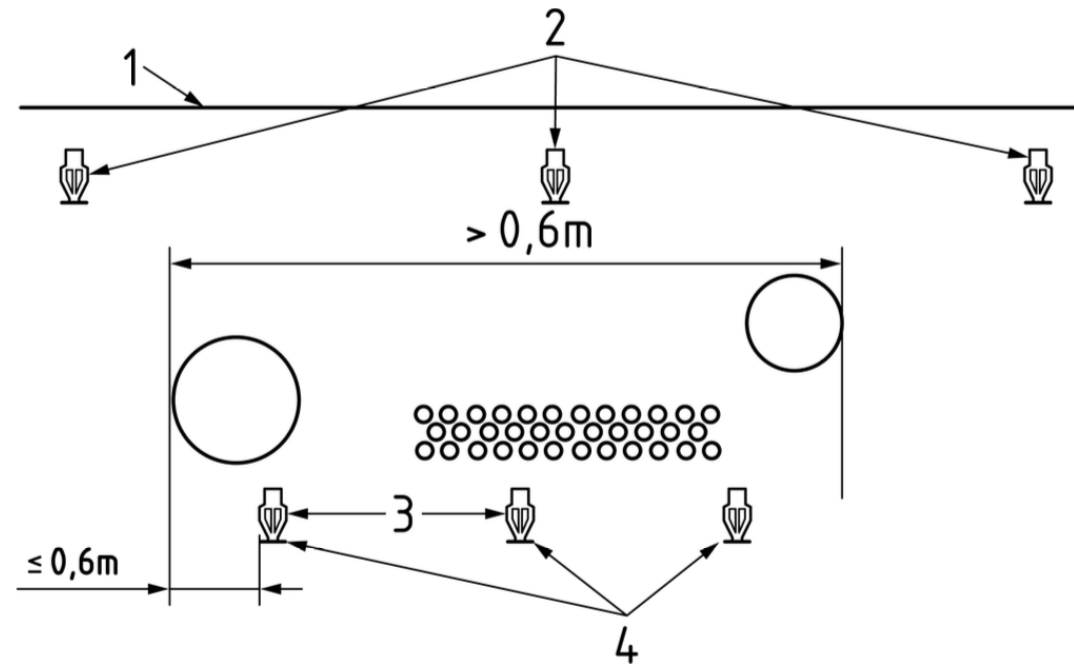
Sprinkler under hinder



Sprinkler under hinder



Sprinkler under hinder



- 3 Install sprinklers on max. 1,2 m linear and 1,5 m² area spacing

Design options for ESFR

Table 7 — Minimum operating pressure for at least 12 ESFR sprinklers ceiling-only design for HHS

Goods Category	Max. ceiling/ roof height	Max. storage height	Pendent orientation nom. k-factors minimum operating pressure in bar for 12 sprinklers in operation						Upright orientation nom. k-factors minimum operating pressure in bar	
	m	m	K200	K240	K320	K360	K400 ^{c d}	K480 ^c	K200	K240
HHS1 to 3	7,6	6,1	3,4	2,4	1,7	1,0	-	-	3,4	2,4
	9,1	7,6	3,4	2,4	1,7	1,0	-	-	3,4	2,4
	10,7	9,1	5,2	3,6	2,4	1,4	-	-	5,2	3,6
	12,2	10,7	-	3,6	2,8	1,7	-	-	-	-
	13,7	12,2	-	-	2,8	2,8	-	-	-	-
	15,2	13,3	-	-	-	-	2,8 ^e	3,8 ^e	-	-
	16,8	14,9	-	-	-	-	5,5 ^f	3,8 ^e	-	-
HHS4	7,6	6,1	3,4	2,4	5,2	4,1	-	-	-	-
	9,1	7,6	3,4	2,4	5,2	4,1	-	-	-	-
	10,7	9,1	-	-	5,2	4,1	-	-	-	-
	12,2	10,7	-	-	5,2	4,1	-	-	-	-
HHS5	9,1	7,6	-	-	-	2,0 ^a	-	-	-	-
	12,2	10,7	-	-	-	4,1 ^{a b}	-	-	-	-

Design options for ESFR

Table 10 — ESFR design with special requirements up to 12,2 m ceiling height

Goods category	Max. ceiling height m	Max. storage height m	Minimum operating pressure as number of sprinklers at pressure in bar			
			K200	K240	K320	K360
HHS1 to HHS3	7,6	6,1	9 @ 2,4	9 @ 1,7	9 @ 1,4	9 @ 1,4
	9,1	7,6	12 @ 3,5	12 @ 2,4	9 @ 1,4	9 @ 1,4
	10,7	9,1	-	-	12 @ 2,0	12 @ 1,6
	12,2	10,7	12 @ 5,2	12 @ 3,6	9 @ 3,5	9 @ 2,8
HHS4	7,6	6,1	10 @ 3,5	10 @ 2,4	10 @ 1,7	10 @ 1,4
	9,1	7,6	15 @ 3,5	15 @ 2,4	10 @ 3,5	10 @ 2,8
	12,2	10,7	-	-	12 @ 5,2	12 @ 4,1
HHS5	7,6	6,1	12 @ 5,2	12 @ 3,6	9 @ 2,2	9 @ 1,7
	9,1	7,6	12 @ 6,9	12 @ 4,8	12 @ 3,5	12 @ 2,8
	12,2	10,7	-	-	-	20 @ 5,2

Men vad hände
med design för 9
sprinkler för de
som har K-faktor
högre än 360



Design options for ESFR

Table 11 — ESFR design with special requirements up to 16,8 m ceiling height

Goods category	Max. ceiling height m	Max. storage height m	Ceiling to element distance mm	Min. aisle width m	Minimum operating pressure as number of sprinklers at pressure in bar			
					K320	K360	K400	K480
HHS1 to HHS3	15,2	13,7	325	1,8	10 @ 4,3	10 @ 3,5	10 @ 2,8 ^a	-
			425	1,8	-	10 @ 5,2	-	9 @ 3,8
	16,8	15,2	325	2,4	-	-	9 @ 5,5	-
			425	1,8	-	-	-	9 @ 3,8

^a The design for 10 sprinklers at 2,8 bar may be reduced to 9 sprinkler at 2,8 bar if the water supply is able to provide a minimum pressure of 5,5 bar from the most remote 4 sprinklers (2 sprinklers on 2 ranges).

Varaktighet vattenkälla – och utformning verkningsyta

Table 6 — Water supply duration and shape of design

Number of ceiling sprinklers in the design	Duration of water supply min	Shape of the design area Number of sprinklers × numbers of range pipes
9	60	3 × 3
10	60	3 × 2+4 × 1
12	60	4 × 3
15	90	5 × 3
16	90	5 × 3+1 × 1
20	120	5 × 4
24	120	6 × 4
25	120	6 × 4+1 × 1
30	120	7 × 4+2 × 1

6.6.2.2 ESFR ceiling independent in-rack sprinkler design – Modular ESFR in-rack sprinkler design”



Ingen begränsning i fråga om takhöjd

Kan användas för HHS1 – HHS5

Gäller bara för open-frame rack

Krav på "aligned flue spaces"

Flöde för in-rack sprinkler behöer ej adderas till taksprinklerkravet

Varaktighet vattenkälla: 60 minuter

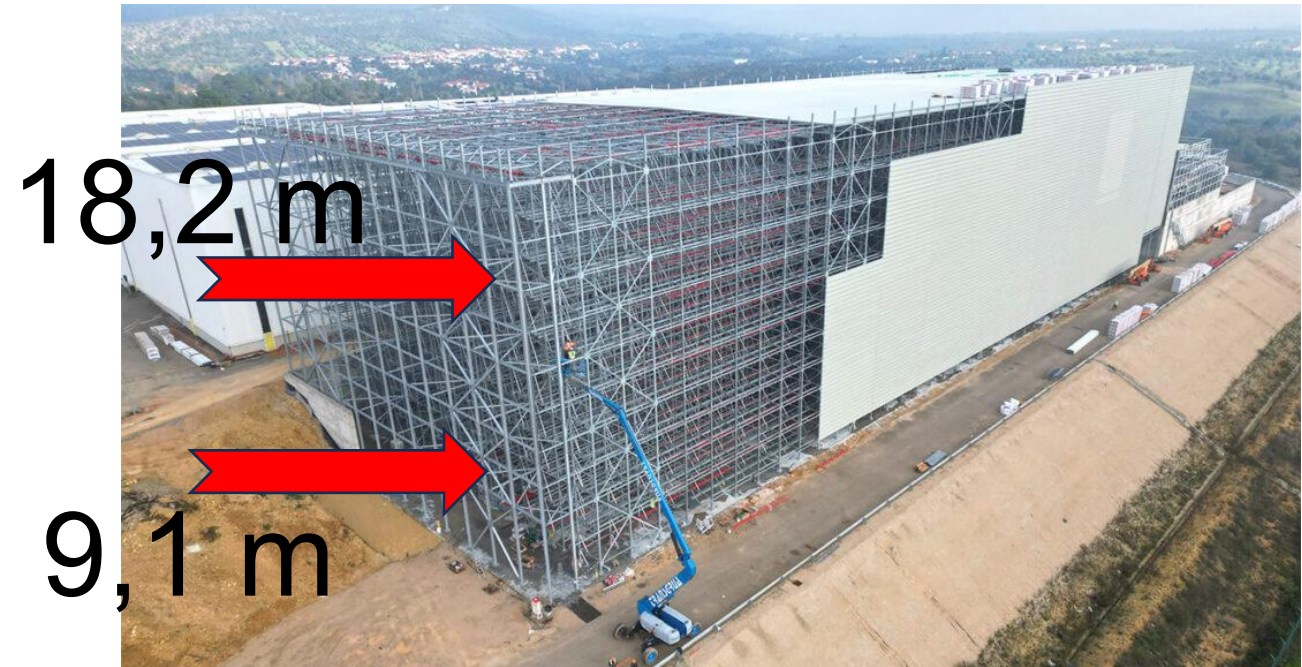
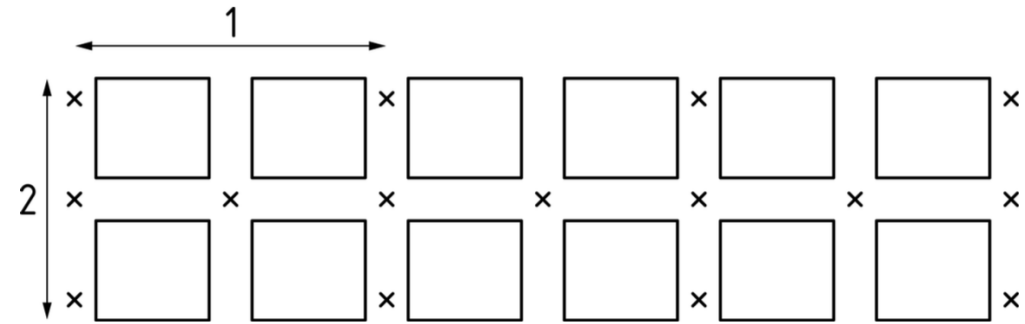




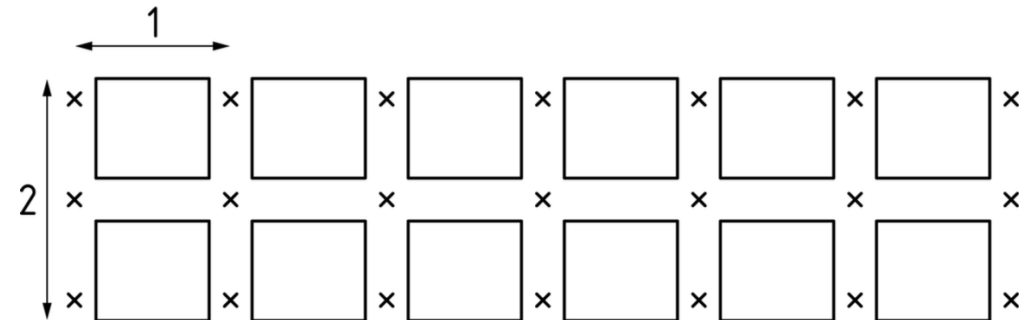
Figure 28 — Plan view of modular in-rack sprinkler arrangement for single-row racks up to 1,8 m deep located against a wall



Key

- 1 Maximum 2,6 m
- 2 Maximum 2,7 m

Figure 29 — Plan view of modular in-rack sprinkler arrangement for double-row racks up to 2,7 m deep



Key

- 1 Maximum 1,4 m
- 2 Over 2,7 and up to 3,7 m



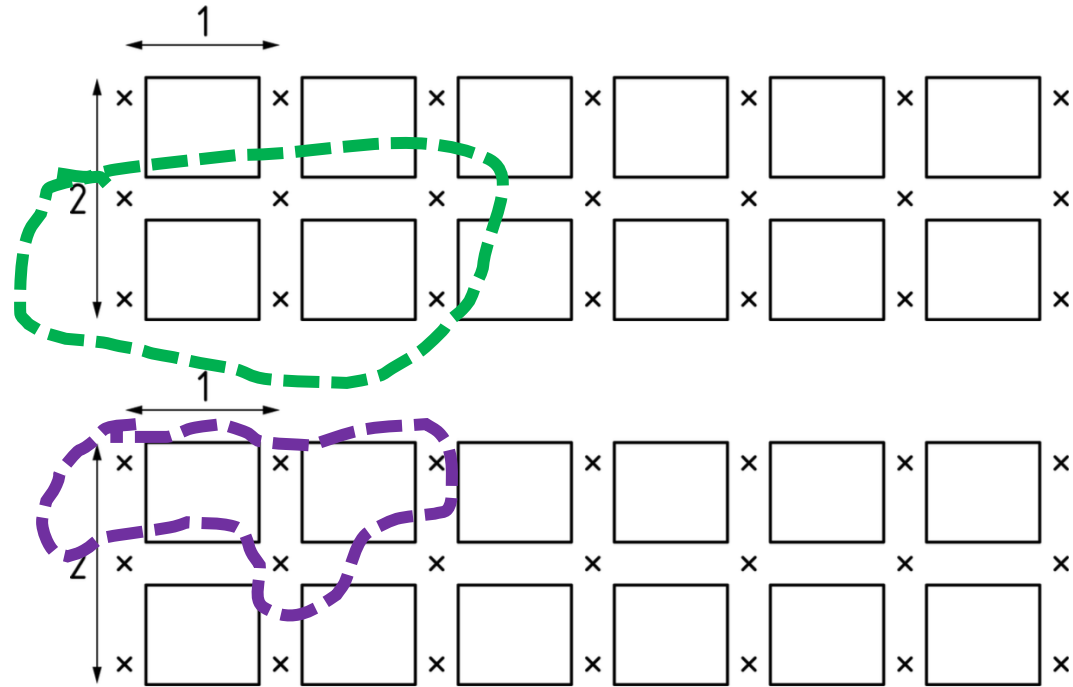
ESFR pendent sprinklers, K200 or K320/ K360. Minsta tillåtna flöde 250/380/455 l/min; 4,5,6 or 6+4 sprinkler design

E.g. HHS5 (Uncartonend – Exposed - Group A Plastics), K320 or K360, på intervaller av 9,1 m

Type of rack, depth	Mimimum flow (l/min)	Number of design sprinklers
Single row, $\leq 0,9\text{m}$	455	4
Single row, $>0,9\text{m}$ and $< 1,8\text{m}$	455	5
Double row	455	6+4
Multiple row	455	6+4



Double row	455	6+4
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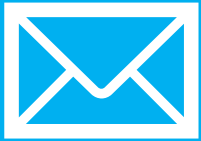
Key

- 1 Maximum 1,4 m
- 2 Over 2,7 and up to 3,7 m

EN12845-2, fortsättningen

- Publicering dec 2024
- Massor med revideringsförslag från Tyskland och Spanien under våren 2025
- Möte för att ta fram Amendment 1, i maj 2025
- Remiss prEN12845:2024+A1/2025 under sommaren 2025, FV under hösten 2025. Publicering december 2025?
- Arbete med Amendment 2 påbörjat i augusti 2025, öppet för Comments till november 2025

Tack för mig!



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