EN 12845: European sprinkler standard
Why is change needed?
Understanding the changes?
Discussion of the Key feature and impact

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MythBusters & MythConception & History

CEN Rules Internal Regulation Part 2 TC 191

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CEN Rules Internal Regulation Part 2 TC 191

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A second look:

- 1850 Factory Mutual Insurance Companies
- 1874 Parmalee Sprinkler
- 1880 FOC- Fire Office Commitee for Insurers – Tarifs - FPA - Fire Protection Association – England
- 1896 NFPA Members Insurance based _ 1903 Australia, England und Russia - Note: „John Freeman“ Member and Co-Initiator NFPA- Factory Mutual Inspection Department
- 1898 regles pour installations d’extinction automatique (APSAD – France)
- 1900 UL Underwriting Labratories . USA/Australien/England
- 1908 – „Sprinklerüberwachungsstelle“ - VdS Schadenverhütung GmbH
- 1947 - 73 years later: – Meili/Jaeger ionisation smoke detector

Which are the most Influential Standards?

- NFPA 13 – since 1913 adopted as code also for personnel safety in the USA.
- FOC Rules 68th – turned into EN12845 via BS
- FM Global Standards – separate from NFPA 03_2010

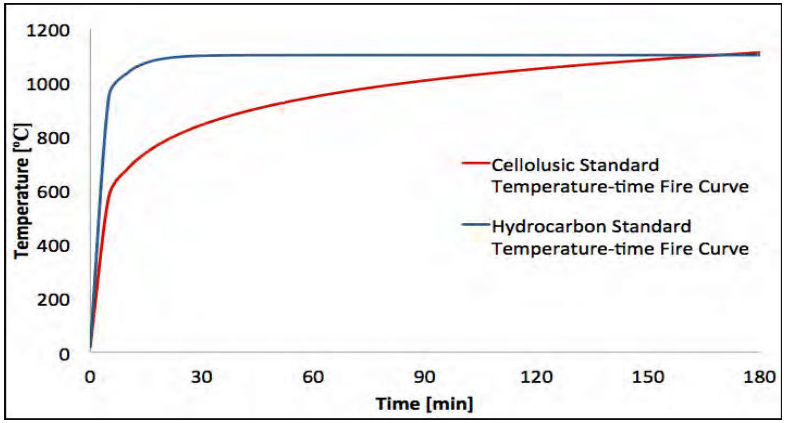
Conclusion: All Sprinkler Standards have been initiated by Risk Transfer!

Need for change because world does change…

- Combustible Load
- 1968 vs. 2020

https://de.wikipedia.org/wiki/VW_Käfer

https://de.wikipedia.org/wiki/BMW_i3



Why is the area of sprinklered property so low?

Did you know: FOC – LH,OH,HH was introduced many years later after it was introduced by NFPA?

- USA About 80 % of all buildings are sprinklered - US Population of 334,3 M People
- EU About 20 % of all buildings are sprinklered? - EU Population of 446 M People – the market in Europe is much bigger than in the USA

Perception: Both sprinkler standards come from Risk Transfer.

- US – Sprinkler is a personnel saftey device…
- EU – Sprinkler is a property protection device

A third look:

- 1874 Parmalee Sprinkler
- 1947 - 73 years later: – Meili/Jaeger Ionisation Smoke Detector (Cerberus AG –Switzerland - Massproduction 1951. – 1998 - Siemens

Purpose:

The EN 12845 should strive to attain a standard of technical excellence on par with, if not surpassing, the widely recognized NFPA 13 and FM Global Standards. It must represent the pinnacle of industrial acceptance and personnel safety, ensuring its acceptance by Authorities Having Jurisdiction (AHJ), Codes, and Insurance Companies for Risk Transfer. Within Europe, it should aspire to become the foremost standard, embodying state-of-the-art technology and enticing manufacturers to incorporate the latest advancements within its framework, thus becoming the ultimate benchmark for all applied guidelines.

One Standard – All Parties – No Conflict – EN12845 The only convergent standard

Benefit of the new standard:

- Fire burns everywhere the same …
- Competition to NFPA 13 /FM Global Standard
- European Control over Technology and Development
- European Supply Chain
- Free Trade
- Globalization
- Reflecting World Wide used Risk Classification
- Enable to accommodate all test results based on risk classification NFPA/FM Global
- Changed the standard to reflect the reality of fire – EN12845 part 2
- Risk has changed – more combustible load – very dense machine population -
- Benefit for END USERS being capable to buy insurance on the European and Global market.
- Incorporate cost benefit of the new large K-Factor technologies.
- One standards that encompasses other standards and is finally in line with common industrial practices (NFPA / FM/ CEA / national. Like CNPP, VdS LPC) with none conflict

Be Careful – Evolution, not Revolution…
Need for change because world does change…

2

Structure of document more user friendly

Content and Structure of future EN 12845 series

EN 12845 (:2015 + A1 : 2019)

EN 12845-1

Core of the existing standard applicable for all the other parts and design using CMDA sprinklers

- ➔ Draft ready for enquiry
- ➔ Translation(D, FR) done
- ➔ Enquiry in Dec 2021 : approved with comments
- ➔ Lots of comments received (4008 comments ->600 pages)
- ➔ Review comments in 2022 & 2023
- ➔ Probable Second enquiry in 2024(?) due to large number of comments

EN 12845-2

Dedicated design for **ESFR** and **CMSA**

To be applied in conjunction with EN 12845-1

- ➔ draft ready
- ➔ approved by WG5 in June 2022
- ➔ 1st Enquiry in Q3-2022
- ➔ Review comments in 2023
- ➔ Formal vote in 202'(?) Before publication

EN 12845-3

Earthquake protection will replace CEN/TS 17551

To be applied in conjunction with EN 12845-1

- ➔ Limited revision of current TS (clarifications, inconsistencies and other limited changes)
- ➔ Enquiry in July 2022
- ➔ Publication expected end of 2023

EN 17 451

Pump sets standard

for use in sprinkler systems conforming to EN 12845

- ➔ Draft for 2nd Enquiry in 2022
- ➔ Review comments in 2022-2023
- ➔ Publication expected end of 2023/2024

Content and Structure of EN 12845-1 (general design & CMDA)

- § 1-3: Scope, references and definitions
- § 4-9: Risk assessment and classification of hazards (contract & planning, extend of protection, non-storage, storage, special features influencing hazard class…)
- §10-12 : hydraulic and Design criteria
- §13-18 components, and installations rules
- § 19-21 Alarms and monitoring
- § 22-24 Pumps and water supply
- § 25-27 Commissioning and maintenance
- Annexes

Annexes

- A : list of goods
- B: model maintenance report
- C: independent certification body
- D: Pre-calculated systems
- E: measure to improve reliability
- F: system not fully operational (impairment)
- G: testing of sprinklers
- H: Distilled spirits in wood barrel
- I: Measurement of wall thickness
- J: special protection concepts (picking, racks, record storages, mini-load)

Content and Structure of EN 12845- (ESFR, CMSA)

- **§ 1-3: Scope, references and definitions**

Only the definitions specific to ESFR / CMSA otherwise refer to 12845-1

- **§ 4: general**

provides guidance to applicable clauses of EN12845-1

- **§ 5: Installation requirements, spacing, roof specificities, obstruction rules**

A lot of similarities between ESFR and CMSA

- **§6 : Design considerations** (a benchmark of most updated tests and standards – NFPA – FM –UL)
  - General considerations applicable for ESFR & CMSA
  - Design for ESFR Design for CMSA
  - Includes combinations with in-rack protection
  - Includes design for roll paper and rubber tyre storage

Annexes

- A : Annex A (normative) Retrofit in-rack sprinkler protection solution for HHS4 currently protected only by in-rack sprinklers in the longitudinal flue space

Main changes / key challenges

- **Classification of goods and activities**
- **Design approach**
- **Water supply**
- **More options on technology**
- **More options for storage protection**

Methodology and process of hazard evaluation : EN12845

Building or construction item	Description	Instruction
Cable tunnel	Cable tunnels in buildings often connect various fire areas.	See Table 6. Cable tunnels shall be protected regardless of the combustible load.
Walkways, bridges, conveyors, shafts or other communications between buildings of/or containing combustible materials	Walkways, bridges, conveyors, shafts or other communications in buildings often connect various fire areas and can contain cables and combustible pipes or other utilities.	See Table 6. See 5.2 for permitted exception. Other walkways, bridges, conveyors, shafts or other communications with cables, pipes or other utilities either in a bridge or a shaft, shall be protected.
Plastic materials in construction and construction products	Combustible insulation within brick or masonry walls	Sprinkler protection shall be based on the fire hazard classification from Clause 8 or 9.
	Exposed unexpanded plastic (excluding window frames, doors or similar)	Sprinkler protection shall be based on FH2 or on the fire hazard classification from Clause 8 or 9, whichever is greater.
	Fire tested less flammable composite panels with a rating of max. Bs1d0 in accordance with EN 13501-1:1:2018	Sprinkler protection shall be based on FH2 or on the fire hazard classification from Clause 8 or 9, whichever is greater.
	Sandwich panel with double metal cladding and with foamed plastic insulation. Expanded plastic covered by a non-combustible layer or at least 10 mm plywood layer.	Sprinkler protection shall be based on FH3 or on the fire hazard classification from Clause 8 or 9, whichever is greater.

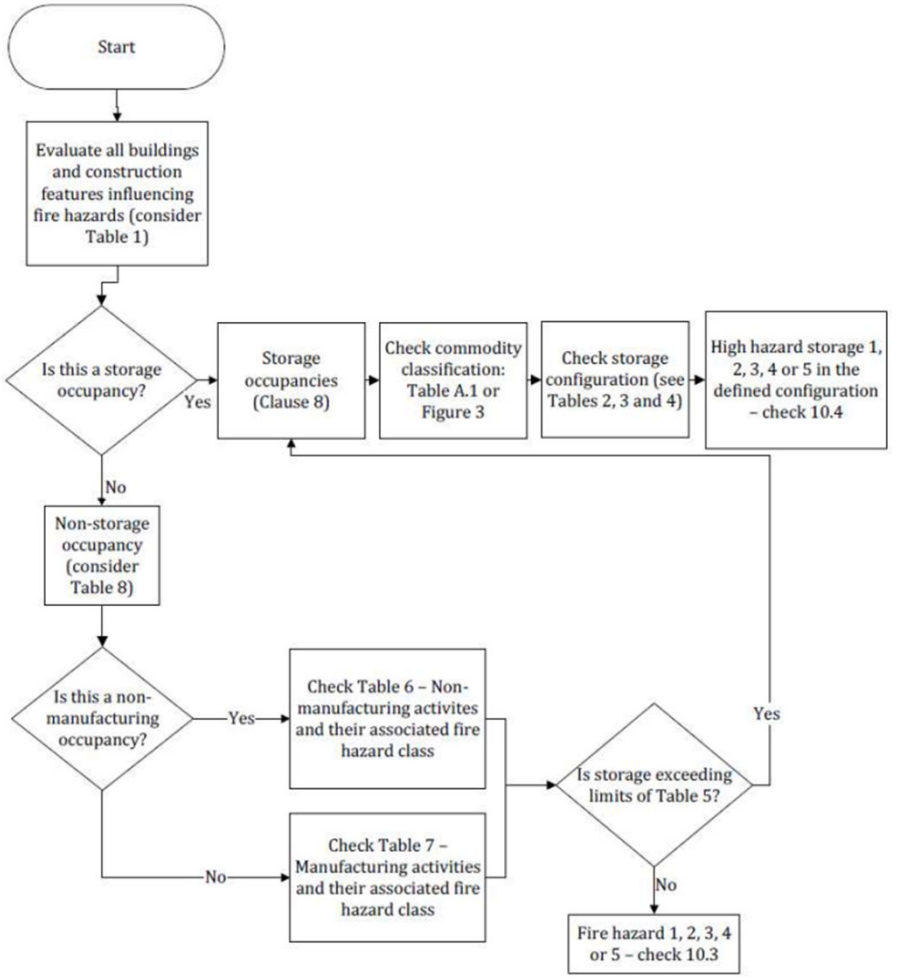


Figure 2 — Methodology and process of hazard classification

Non storage Fire Hazards (FH)

Table 5 — Non-storage fire hazard descriptions and maximum storage height in FH classes

Fire hazard	Typical description of non-storage fire hazard	Allowed storage
FH1	This hazard class reflects a typical non-manufacturing occupancy with limited fire load.	No storage allowed~~None~~.
FH2	This hazard class reflects a typical manufacturing or non-manufacturing occupancy with moderate amount of combustibles.	HHS1/ HHS2 storage can be up to 3,2 m. HHS3 storage can be up to 1,7m. HHS4 storage can be up to 1,5 m. HHS5 storage can be up to 1,2 m. Gondola shelves shall be limited to 1,2 m width (measured aisle to aisle) regardless the goods.
FH3	This hazard class reflects a typical manufacturing or non-manufacturing occupancy with an ordinary amount of combustibles.	See Tables 2 and 10 for the maximum storage heights and other requirements in relation with Table 9 for the design density for different protection criteria.
FH4	This hazard class reflects a typical manufacturing or non-manufacturing occupancy with a high amount of combustibles.	
FH5	This hazard class reflects a manufacturing occupancy with high challenge fire hazards, where flammable or combustible liquids processes are involved, high amount of plastics and other hazards are present.	

Table 2 — Determination of maximum storage block areas for each fire hazard category and storage configuration in non-storage applications

Storage configuration	Ceiling protection according to (see 9.2)	Maximum storage block area for goods ≤ HHS3 m^2	Maximum storage block area for goods HHS4 and HHS5 m^2	Minimum width of aisles of separating rows of storage within the block area m	Minimum separation clearance around storage block area m
STC1	≥ FH2	50	6	-	2,4
STC2	≥ FH2	50	6	1,2	2,4
STC3	≥ FH2	50	6	-	2,4
STC4	≥ FH2	50	6	1,2	2,4
STC5	≥ FH2	50	6	1,2	2,4

NOTE 1 For STC3 standard portable racks (post pallets) shall have an aisle of 2,4 m between the rows. The depth of each row shall be limited to 4 pallets. E.g. for up to HHS3 a block of 4 pallets by 12 pallets is acceptable.

NOTE 2 Storage configurations include any sub storage configurations.

NOTE 3 Idle pallets shall be limited to storage blocks of no more than 6 m^2.

Classification of goods and activities :non storage application

- currently (9 options)
  - Light Hazard (LH)
  - Ordinary Hazard (OH 1,2,3,4)
  - High Hazard Process (HHP 1,2,3,4)

- **Future (5 options)**
  - **Fire Hazard 1 (FH1)**
  - **Fire Hazard 2 (FH2)**
  - **Fire Hazard 3 (FH3)**
  - **Fire Hazard 4 (FH4)**
  - **Fire Hazard 5 (FH5)**

- **Table 6: non-manufacturing activities**
- **Table 7: manufacturing activities**

With detailed classification within a given occupancy :

e.g: food & beverage is currently 0H2 or OH3 but without distinction of hazard zone within the plant. Retail: differences according to height of shelves and goods.

Classification of goods and activities :non storage application

Classification of typical features common to all activities

Activity sector	Description	Specific details	Minimum fire hazard
Typical features and areas common to all type of facilities	Technical room (building services, plant room) and other rooms not representing the main activity of the site	Changing rooms	FH1
		Server rooms, IT/ electronics related rooms	FH2
		Electrical room	FH2
		Technical rooms, compressor rooms, ammonia rooms, forklift charging stations, HVAC with combustible ducts, generators smaller than 500 kVA, hydraulic units for lifts and escalators.	FH2
		Technical rooms involving thermal oil or with flammable or combustible liquid	FH3
		HVAC with non-combustible ducts,	FH1
		Sprinkler diesel pump rooms	FH3
		Sprinkler electrical pump rooms	FH1
		Laboratories with no more than 100 l of combustible liquids stored in fire proof cabinet	FH2
		Cable tunnels and cable spreading, distribution, patch rooms	FH4
		Commercial type kitchen including deep fryer	FH2
		Laundry with less than 100 l of combustible liquid	FH2
		Laundry or Laboratories with more than 100 l of combustible liquid	FH3
		Ammonia rooms	FH3

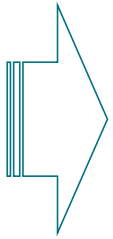
•Clarification for a more adjusted design

Within a given sector, different risk category according to process and conditions

Food and beverages	Abattoirs, meat factories, bakeries, biscuit factories, breweries, chocolate factories, confectionery, dairy factories, animal feed factories, slaughter-houses, seafood processing, corn mills, dehydrated vegetable and soup factories, sugar factories, alcohol distilleries, tobacco processing, beverage bottling plants, blow moulding and snack food manufacture.	General	FH2
		Areas where non-flammable/ non-combustible liquids are processed in non-combustible vessels Mashing and fermenting	FH2
		Refrigerated areas or conditioning rooms made of sandwich panels.	FH3/ FH4 see Table 1
		Use of plastic logistic aids (baskets, trays, boxes, pallets) or combustible vessels	FH3. See Table 5.
		Areas where dry organic materials (e.g. dry food, tobacco) are processed.	FH3
		Ammonia rooms	FH3
		Mixing, blending, boiling of flammable or combustible liquids (e.g. aromas and solvents).	FH4
		Blow moulding container production process with plastic including PET. Bottling areas	FH3
		Processes involving fat or vegetable oils, processes using flammable or combustible liquids, heat transfer oil systems. See also Table 8. Tank rooms, barrel dumping and filling areas	FH4

Classification of goods and activities :storage application

- currently (4 classes)
- High Hazard Storage (HHS 1,2,3,4)



- **Future (5 classes)**
  - **HHS 1 (low combustible)**
  - **HHS 2 (limited amount of plastic)**
  - **HHS 3 (cartoned unexpanded plastic)**
  - **HHS 4 (exposed unexpanded plastic & expanded cartoned plastic)**
  - **HHS 5 (expanded exposed plastic)**

- **Consistent with large scale fire test configuration , ESFR and CMSA design**
- **To clearly identify differences between exposed plastic and cartoned plastic**

Classification of goods for storage:

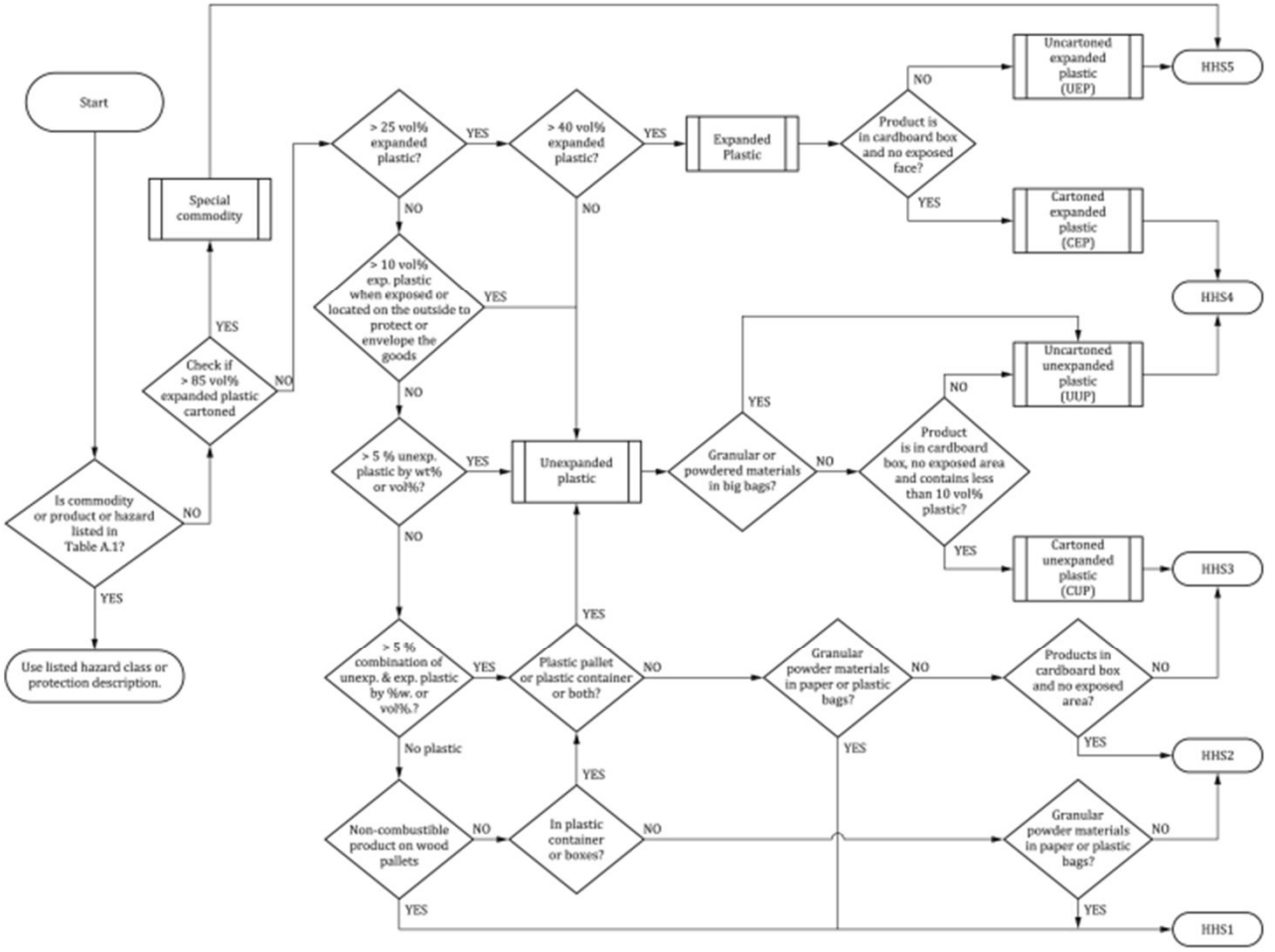
Table A.1 — HHS Category by goods

Product	HHS-Category	Notes and additional requirements
Acrylics	4	-
Acrylonitrile-butadiene-styrene (ABS)	4	-
Adhesives with solvent container less than 0,5 l	4	For larger containers, refer to flammable liquids.
Adhesives without solvent	1	-
Aerosols in cans or bottles with propellant gas with either combustible content or a combustible propellant gas	See 11.2.	
Aluminium foil laminate paper	2	-
Asphalt paper in horizontal rolls	2	-
Asphalt paper in vertical rolls	3	-
Automobile bumpers	4	-
Batteries without electrolyte (plastic casing)	4	-
Batteries, dry cell	2	Excluding lithium batteries.
Batteries, wet-cell; filled with non-ignitable electrolyte	3	-
Beeswax or paraffin wax in block	5	-
Beverage: Beer and wine (20 % or less alcohol) in metal, glass or ceramic containers in plastic crates	4	-
Beverage: Beer and wine (20 % or less alcohol) in metal, glass or ceramic containers in cartons or in wood crates	1	-
Beverage: Beer and wine (20 % or less alcohol) in plastic containers larger than 200 l	2	-
Beverage: Beer and wine (20 % or less alcohol) in plastic containers larger than 200 l	3	-
Beverage: Beer and wine (20 % or less alcohol) stored in wooden barrels	2	-
Beverage: Cardboard drink boxes filled with	2	Plastic-coated, wax-coated

- **Either you have directly the category in annex A1 (alphabetic list)**
  - **consider wood pallets**
  - **If plastic pallets ➔ +1 category (e.g. HHS2➔HHS3)**
- **Or apply the methodology according to plastic contains if good is not listed in annex A1**

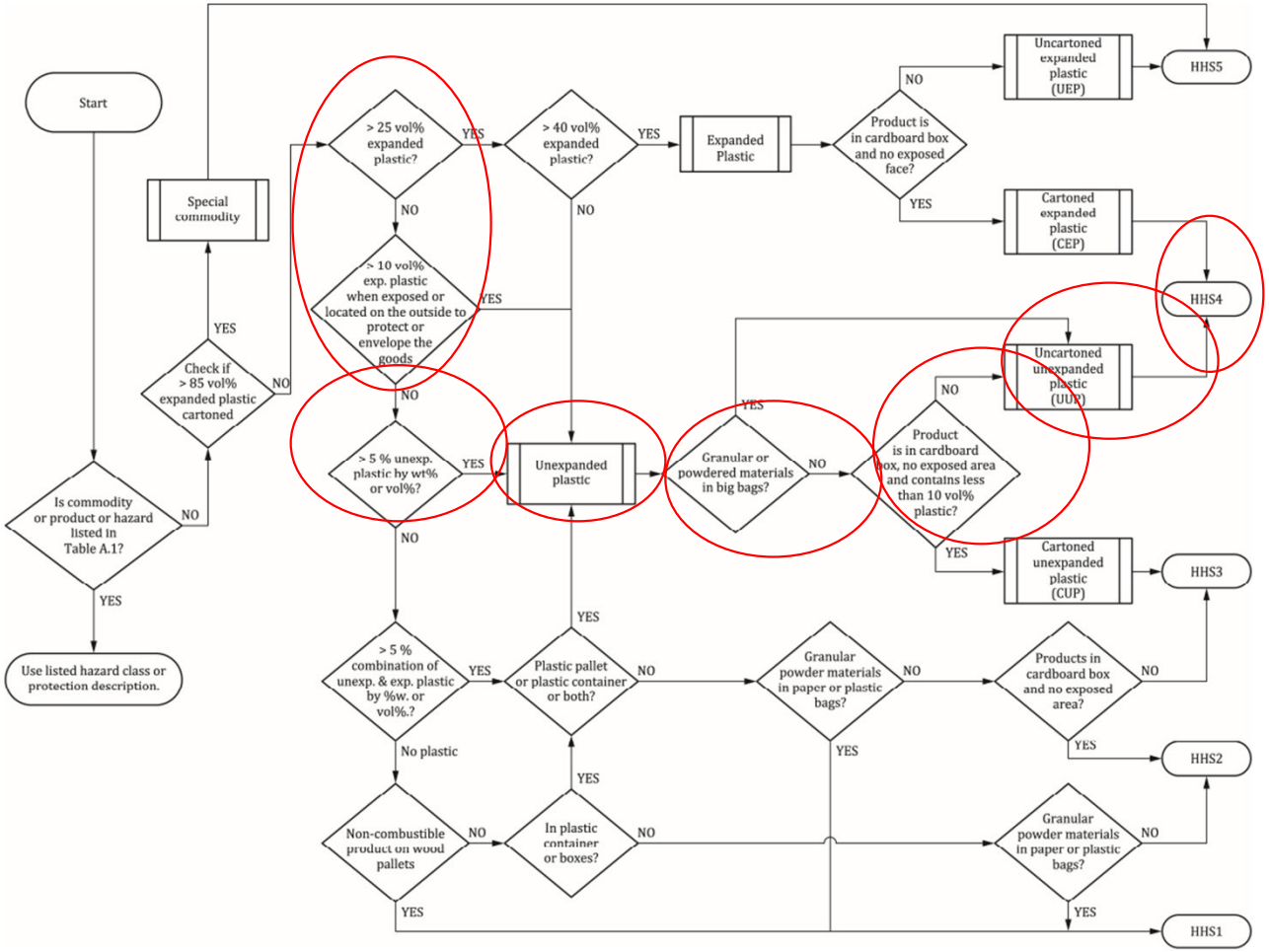
methodology for good classification

Product	HHS-Category	Notes and additional requirements
Milk powder	2	In bags or sacks.
Motors, electric	1	
Non-flammable or non-combustible liquids in 20 l or smaller plastic containers	2	
Non-flammable or non-combustible liquids or semi-liquids stored in solid plastic containers of any size above 20 l with a wall thickness larger than 6 mm	4	
Non-woven fabrics: finished products that contain non-woven fabrics with plastic content less than 40 % by volume, cartoned	3	E.g. disposable diapers and personal care products. HHS5 if the non-woven fabric is exposed in a storage context.
Non-woven fabrics: finished products that contain non-woven fabrics, with plastic content larger than 40 % by volume, cartoned	4	E.g. disposable diapers and personal care products. HHS5 if the non-woven fabric is exposed in a storage context.
Non-woven synthetic fabric exposed	See 11.6.	Fluffy products that contain non-woven fabrics, e.g. disposable diapers and personal care products.



The determination of both fire hazard category (HHS1 to HHS5) and storage configuration STC
is required to determine the adequate, effective sprinkler protection in other sections (see Tables 2 to 4). Aisles are measured face to face between goods.

Classification of goods : example



Television screens in cardboard boxes:

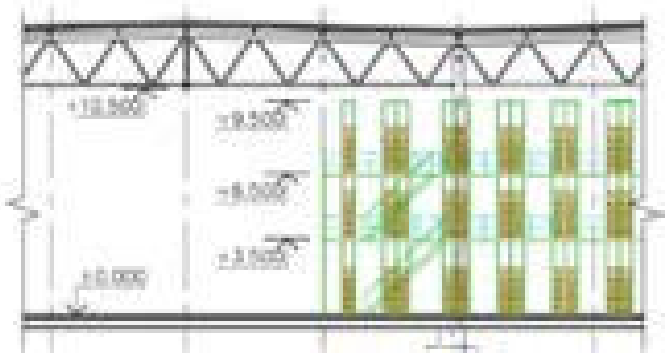
- **contains 30% of plastic in weight**
- **and 15% in volume of expanded polystyrene ➔ HHS4**

Type of storage

Desig-nation	Storage configuration
STC1	Solid pile
	Palletized storage
STC2	Shelves storage
	Back-to-back shelf storage
	Bin box
	Picking racks
STC3	Portable racks
STC4	Open frame racks
STC4.1	Open frame single row rack
STC4.2	Open frame double row rack
STC4.3	Open Frame Multiple Row Rack with transverse flues parallel to loading direction and longitudinal flues perpendicular to loading direction
STC5	Racks with solid shelving
STC5.1	Single Row Rack with solid shelving
STC5.2	Double Row rack with solid shelving
STC5.3	Multiple Row Rack with transverse flues parallel to loading direction and longitudinal flues perpendicular to loading direction with solid shelving

+ Introduce numbers of storage configurations : more options

Mini load (STC 10), Drive through (STC 6), multilevel shelf storage (STC 7)… and others



Type of storage

Interesting option to enable extension of block storage above 150m²

Desig-nation	Storage configuration	Description	Additional requirement
STC1	Solid pile	On-floor storage, without pallets or other material handling devices. Unit loads are placed on top of each other, leaving no horizontal spaces between unit loads.	Maximum storage block area shall be 150 m². When necessary to extend above 150 m² up to 250 m², the area of operation shall be increased proportionally. Minimum clearance around storage block area shall be 2,4 m.
	Palletized storage	A storage arrangement that consists of product stored on pallets. Pallet loads are placed one on top of another with the bottom pallet located directly on the floor.	

Design approach: Non -storage application- design criteria (table 9)

➔ Similar design for standard buildings compared to today's standard

Because fire and sprinkler behave differently in high building, it is essential to include this parameter in the design

➔Design density and / or area of operation varies with building height for a same activity

Hazard class	Ceiling height							
	≤9 m		≤13,5 m [a]		≤18 m [a]		>18 ≤30 m [a b]	
	Density	Area of operation	Density	Area of operation	Density	Area of operation	Density	Area of operation[b]
	mm/min	m2	mm/min	m2	mm/min	m2	mm/min	m2
FH1	5	72	5	144	7,5	260	22,5	120
FH2	5	216	7,5	260	10	260	22,5	120
FH3	7,5	260	10	260	12,5	260	22,5	120
FH4	10	260	12,5	260	15	260	22,5	260
FH5	12,5	260	12,5	300	17,5	300	22,5	260

Under discussion

a. For atria this shall not apply, instead use density and area of operation for a building up to 9 m (min FH2) shall be used regardless of the actual height of the atrium.

b. Minimum K240 sprinkler shall be used for building higher than 18m. No dry installations are allowed for >18>= 30m

Design approach: storage application- design criteria (table 10)

- CMDA : similar approach as today but includes HHS1 ➔ HHS5
  - ➔ HHS1 & 2 : no change
  - ➔ HHS 3 similar to HHS3 but slightly more severe if >3,5m
  - ➔ HHS 5 same as previous HHS4
  - ➔ HHS 4 between previous HHS and previous HHS4

Table 10 —Design criteria for HHS with roof or ceiling protection only

Storage configuration (see Table 3)	Max. allowed storage height in m					Density in mm/min	Area of operation in m² [a]
	HHS1	HHS2	HHS3	HHS4	HHS5		
STC1 Solid pile palletized storage	5,3	4,1	2,9	2,3	1,6	7,5	260
	6,5	5,0	3,5	2,8	2,0	10,0	
	7,6	5,9	3,7	3,2	2,3	12,5	
	7,6	6,7	4,1	3,7	2,7	15,0	
	7,6	7,5	4,7	4,1	3,0	17,5	
	-	-	5,2	4,5	3,3	20,0	300
	-	-	5,7	4,9	3,6	22,5	
	-	-	6,3	5,3	3,8	25,0	
	-	-	6,7	5,7	4,1	27,5	
	-	-	-	6,	4,4	30,0	

NEW

K

Table 4 — Design criteria for HHS with roof or ceiling protection only

Storage Configuration	Maximum permitted storage height m				Design density mm/min	Area of operation (wet or pre-action system (see NOTE) m²
	Category I	Category II	Category III	Category IV		
ST1 Free standing or block stacking	5,3	4,1	2,9	1,6	7,5	260
	6,5	5,0	3,5	2,0	10,0	
	7,6	5,9	4,1	2,3	12,5	
		6,7	4,7	2,7	15,0	
		7,5	5,2	3,0	17,5	
			5,7	3,3	20,0	300
			6,3	3,6	22,5	
			6,7	3,8	25,0	
			7,2	4,1	27,5	
				4,4	30,0	

current

Design approach: storage application- design criteria (table 10)

- CMDA : similar approach as today but includes HHS1 ➔ HHS5 and combination of numerous storage configurations
- Updated design for ESFR : separate standard (EN 12845-2)
- Updated design for CMSA : separate standard (EN 12845-2)
- Updated design for special hazards (flammable liquids, hanging garments, rubber tyres…

Storage configuration	Maximum permitted storage height (m)					Density (mm/min)	Area of operation (m^2) See note 1
	HHS1	HHS2	HHS3	HHS4	HHS5		
STC4.3	4,7	3,4	2,2	1,9	1,6	7,5	260
STC5.1	5,7	4,2	2,6	2,3	2,0	10,0	
STC5.2		5,0	3,2	2,8	2,3	12,5	
			3,7	3,2	2,7	15,0	
				3,6	3,0	17,5	
STC6	3	3	1,7	1,5	1,2	7,5	260
STC5.3	4,7	3,4	2,2	1,9	1,6	10,0	
STC9	5,7	4,2	2,6	2,3	2,0	12,5	
		5,0	3,2	2,8	2,3	15,0	
			3,7	3,2	2,7	17,5	

Note 1: For dry pipe installation and pre-action type C installation, add 25% for the area of operation.

Design approach: Installation criteria

- No revolution, but number of improvements and clarifications:
  - Obstruction rules
  - Components that are not part of EN 12259 –series
  - Type of installations and related requirements (antifreeze, pre action…)
  - Zoning
  - Protection of concealed spaces
  - Location of in-rack sprinklers
  - Guidelines regarding interaction with smoke vents (acceptable smoke vents actuation according to sprinkler type)
  - Type of pipe and thickness updated: more option on technology with press fitting, concrete casting, CPVC, plastic pipes….

Design approach: Installation criteria example of pipe thickness of pipes (more detailed)

Table 41 — Minimum wall thickness for steel pipes

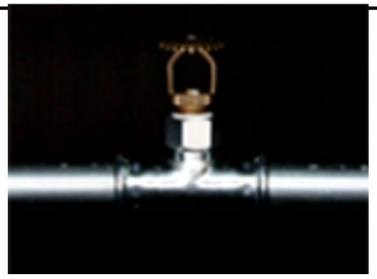
Nominal diameter	External diameter	Roll grooved or welded in mm				Threaded pipes and cut grooved in mm			
		EN 10216-1	EN 10255 (L2/L-series)	EN 10217-1	EN 10305-3	EN 10255 (M-series)	EN 10216-1	EN 10217-1	EN 10305-3
DN 20	26,9	2,6	-	2,6	3	-	3,2	3,2	3,5
DN 25	33,7	2,6	2,6	2,6	3	3,2	3,2	3,2	3,5
DN 32	42,4	2,6	2,6	2,6	3	3,2	3,2	3,2	3,5
DN 40	48,3	2,6	2,9	2,6	3	3,2	3,2	3,2	3,52
DN 50	60,3	2,6	2,9	2,6	3	3,6	3,6	3,6	4
DN 65	76,1	2,6	3,2	2,6	3,5	3,6	3,6	3,6	4
DN 80	88,9	2,9	3,2	2,9	3,5	4	4	4	4
DN 100	114,3	3,2	3,6	3,2	4	4,5	4,5	4,5	4,5
DN 125	139,7	3,6	4,5	3,6	4,5	5	5	5	5
DN 150	168,3 [a]	4	4,5	4	4,5	5	5	5	5
DN 200	219,1	4,5	-	4,5	-	-	6,3	6,3	-
DN 250	273	5	-	5	-	-	6,3	6,3	-
DN 300	323,9	5,6	-	5,6	-	-	7,1	7,1	-
DN 350	355,6	5,6	-	5,6	-	-	8	8	-
DN 400	406,4	6,3	-	6,3	-	-	8,8	8,8	-
DN 450	457	6,3	-	6,3	-	-	10	10	-
DN 500	508	6,3	-	6,3	-	-	11	11	-

[a] 165,1 for EN 10255.

Table 42 — Minimum wall thickness for roll grooved, welded or press-fitted stainless steel pipes

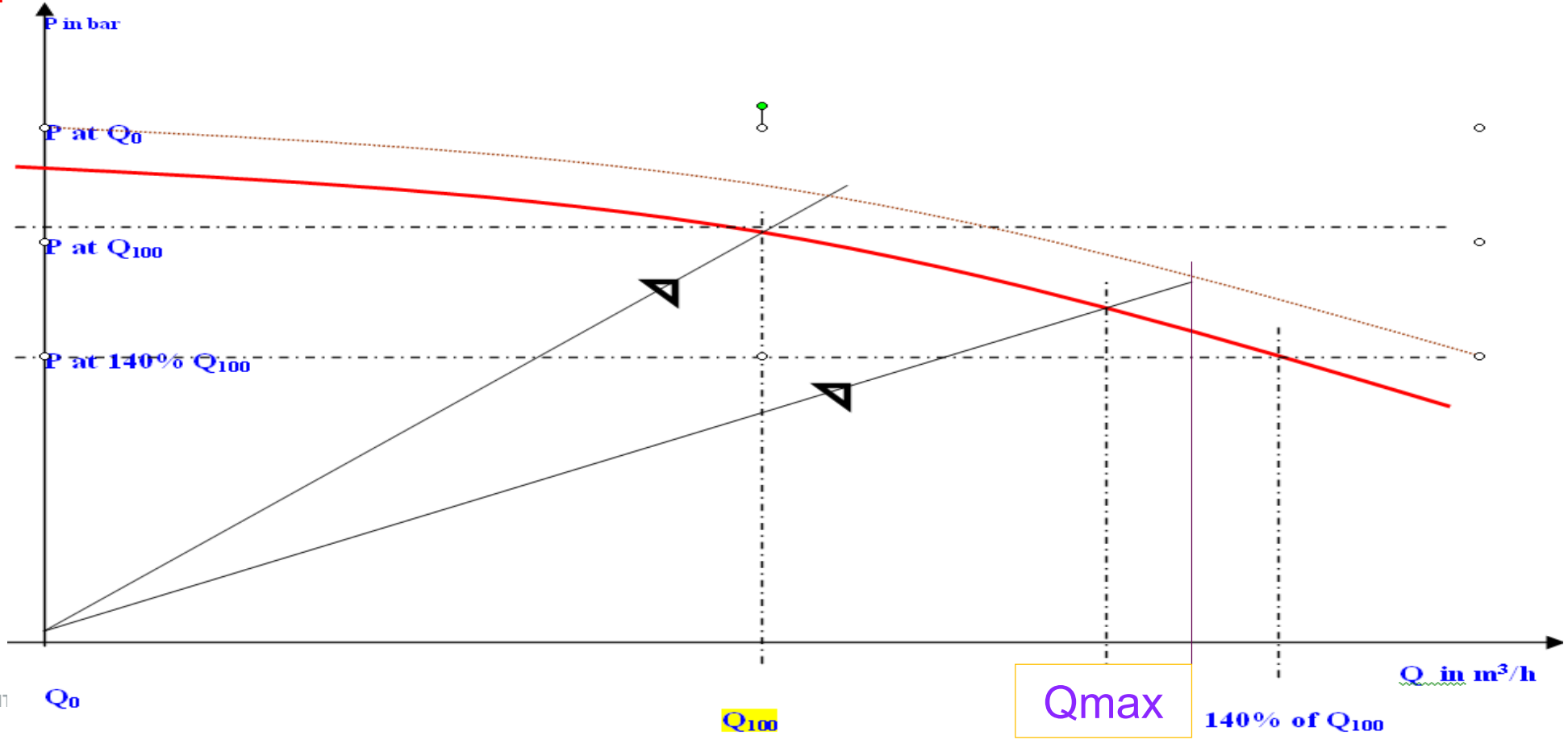
Roll-grooved or welded connections [a]		Press-fitting connection	
Nominal diameter	Minimum wall thickness	Corresponding diameter applicable for press-fitting pipe	Minimum wall thickness
DN	mm	mm	mm
20	2,0	22,0	1,2
25		28,0	1,2
32		35,0	1,5
40		42,0	1,5
50		54,0	1,5
65	2,9	64,0	2,0
80		76,1	2,0
90		88,9	2,0
100		108,0	2,0
125	3,2	Not applicable.	
150			
200			
250	4,0		

[a] Thinner wall thicknesses shall be accepted by authorities based on test and/or technical documentation.



Water supply: new reference point

Water tank volume based on Q100 and not on Qmax anymore ➔ smaller volume of tanks



Design approach: Water supply

•Suction pipe diameter ➔ increase of maximum velocity ➔ **smaller diameter : aligned with other standards ➔From 1,8 m/s to 4m/s in positive head** (from 1,5 to 2,5m/s in suction lift condition)

• guidelines for selecting type of water supply according to category of risk and number of sprinklers

	Acceptable water supply		
Category of risk & Number of sprinkler supplied by the same water supply (2)	Single water Supply	Single superior water supply	Duplicate water Supply
FH1	X	X	X
FH2 less than 1000 spk	X	X	X
FH2 more than 1000 spk		X	X
FH3-FH5 less than 500 spk	X	X	X
FH3-FH5 more than 500 spk		X	X
HHS less than 500 spk	X	X	X
HHS from 500 to 5000 spk		X	X
HHS more than 5000spk			X

• specifications for hydrants and hose demand where connected to the same water supply: 90 m3/h in FH1 and 2 and 120M3/h for other cases

User program: A clear indication of actions and frequency

a) Program of test activities (T)
b) Program of maintenance activities (M)
c) Program of Inspection, including organizational and structural topics (I)

Description	Weekly	Monthly	Quarterly	Half-yearly	Yearly	Three-yearly	Ten-yearly
Water levels	I. 27.4.1.3			T. 27.4.4.1			
Water motor alarm	T. 27.4.1.4				M. 27.4.5.4		
Automatic pump starting	T. 27.4.1.5						
Diesel engine driven pump running	T. 27.4.1.6						
Heating tracing	T. 27.4.1.7						
Batteries		T. 28.4.2.1			M. 27.4.5.5		
Water storage tank		I. 28.4.2.2				M. 27.4.6.1	M. 27.4.7.1

EN 12 845 -2 changes in ESFR

Design for ESFR installations

- "Traditionally" Designed based on 12 spk heads
- Alternate solution exists with 9, 10 or 15 spk head in simultaneous operation, but with other minimum pressure
- Rules for obstructions and compensatory measures are different if we refer to FM or NFPA or latest tests

Table 7 — Minimum operating pressure for ESFR sprinklers design for HHS

Goods classification	Max. ceiling height in m	Nominal k-factors							
		200	240	320	360	400[b]	480[b]	200	240
		ESFR sprinklers, pendent orientation minimum operating pressure in bar (number of sprinklers)						ESFR sprinklers, upright orientation minimum operating pressure in bar	
HHS4	4,5	2,2 (12 spk)	1,5 (12 spk)	-	-	-	-	-	-
		-	-	1,7 (9 spk)	1,4 (9 spk)	-	-	2,2 (15 spk)	1,5 (15 spk)
	7,6	3,4 (12 spk)	2,4 (12 spk)			-	-	-	-
		-	-	1,7 (10 spk)	1,4 (10 spk)	-	-	-	-
	9,1	3,4 (12 spk)	2,4 (12 spk)	5,2 (12 spk)	4,1 (12 spk)	-	-	-	-
		3,4 (15 spk) [f]	2,4 (15 spk) [f]	3,5 (10 spk)	2,8 (10 spk)	-	-	-	-
	12,2	-	-	5,2 (12 spk)	4,1 (12 spk)	-	-	-	-
	13,7	-	-	-	4,1 (12 spk) [l m]	-	-	-	-

EN 12 845 -2 changes in ESFR obstruction

Design for ESFR installations

- Rules for obstructions and compensatory measures are different if we refer to FM or NFPA or latest tests
- Scheme shows the maximum allowable size of object in the zone

5

Visible Impression

6

Call for Duty! – Be part of it – Participate in TC191/WG5 TG2

Purpose & Vision

The EN 12845 should strive to attain a standard of technical excellence on par with, if not surpassing, the widely recognized NFPA 13 and FM Global Standards. It must represent the pinnacle of industrial acceptance and personnel safety, ensuring its acceptance by Authorities Having Jurisdiction (AHJ), Codes, and Insurance Companies for Risk Transfer. Within Europe, it should aspire to become the foremost standard, embodying state-of-the-art technology and enticing manufacturers to incorporate the latest advancements within its framework, thus becoming the ultimate benchmark for all applied guidelines.

One Standard – All Parties – No Conflict – EN12845 The only convergent standard

We need you - Call for Duty

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