

I CONGRESO DE SEGURIDAD INDUSTRIAL EN PUERTOS - A CORUÑA

I CONGRESS OF SAFETY IN PORTS – A CORUÑA

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25TH AND 26TH MARCH 2015

The evolution of the fire safety precautions in the petrochemical industry and the question to install active fire suppression systems nowadays

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Puertos del Estado



Willem Hamer Associate Director Fire Leader Europe

- **12,5 year fire commander**
- **12 year experience in the oil/gas industry (fire & hazardous materials)**
- **8 year principal fire consultant**



NFPA is based on general assumptions

NFPA gives the opportunity to improve fire safety by fire engineering

- NFPA 13 first edition 1896

NFPA 13

Nothing in this standard shall be intended to restrict new technologies or alternate arrangements, provided the level of safety prescribed by this standard is not lowered

- NFPA 13 edition 2013

- NFPA 11 first edition 1958

NFPA 11

Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

- NFPA 11 edition 2010



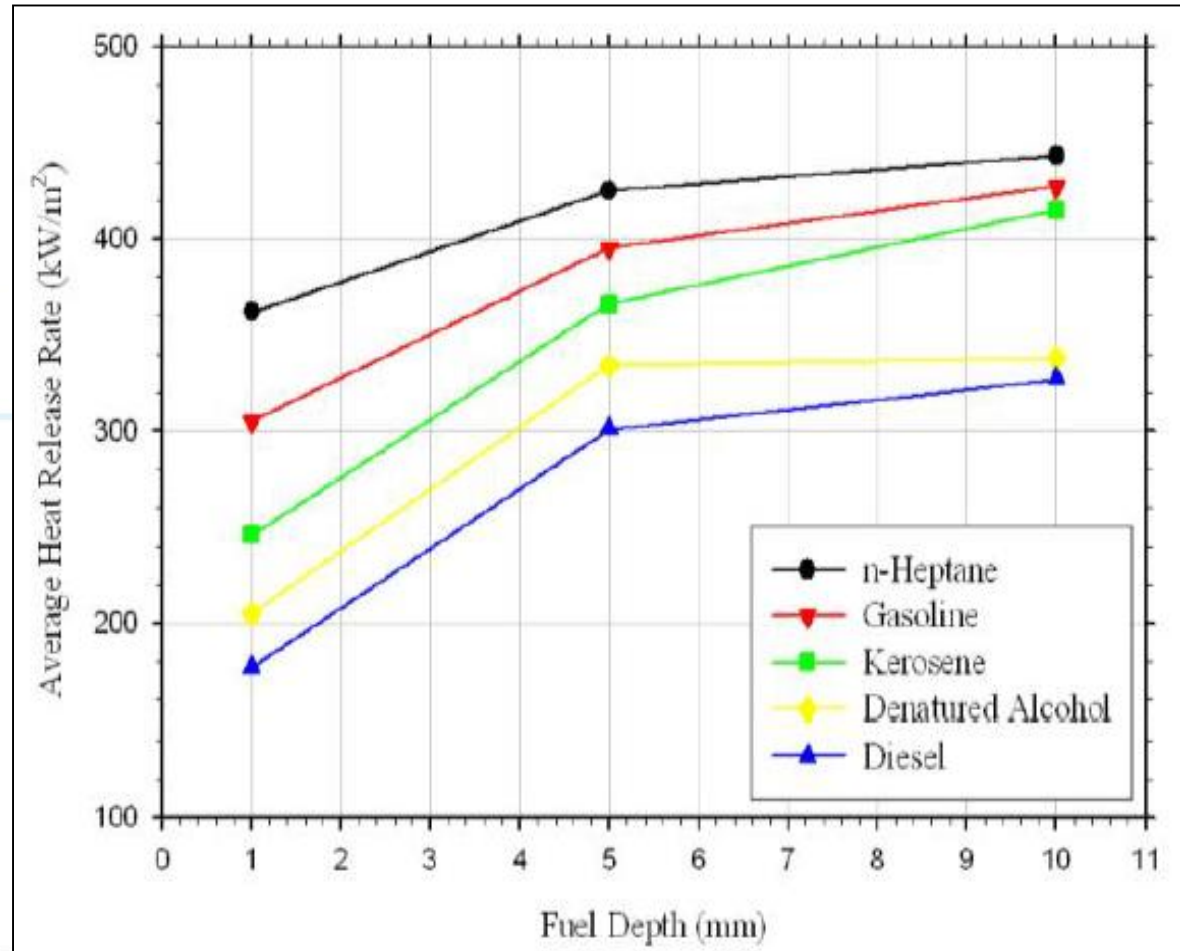
Modern petrochemical installations are well insulated with a non-flammable material*

*Average mass & thickness

- ❖ Mass of 100 kg/m^3
- ❖ Minimum thickness of 30 mm



- Spill fire
 - ❖ 1-2 mm
- Heat Release Rate
- Duration time



Burning rate

- Gasoline 0,048 kg/m²-sec
- Diesel 0,045 kg/m²-sec
- Methanol 0,017 kg/m²-sec

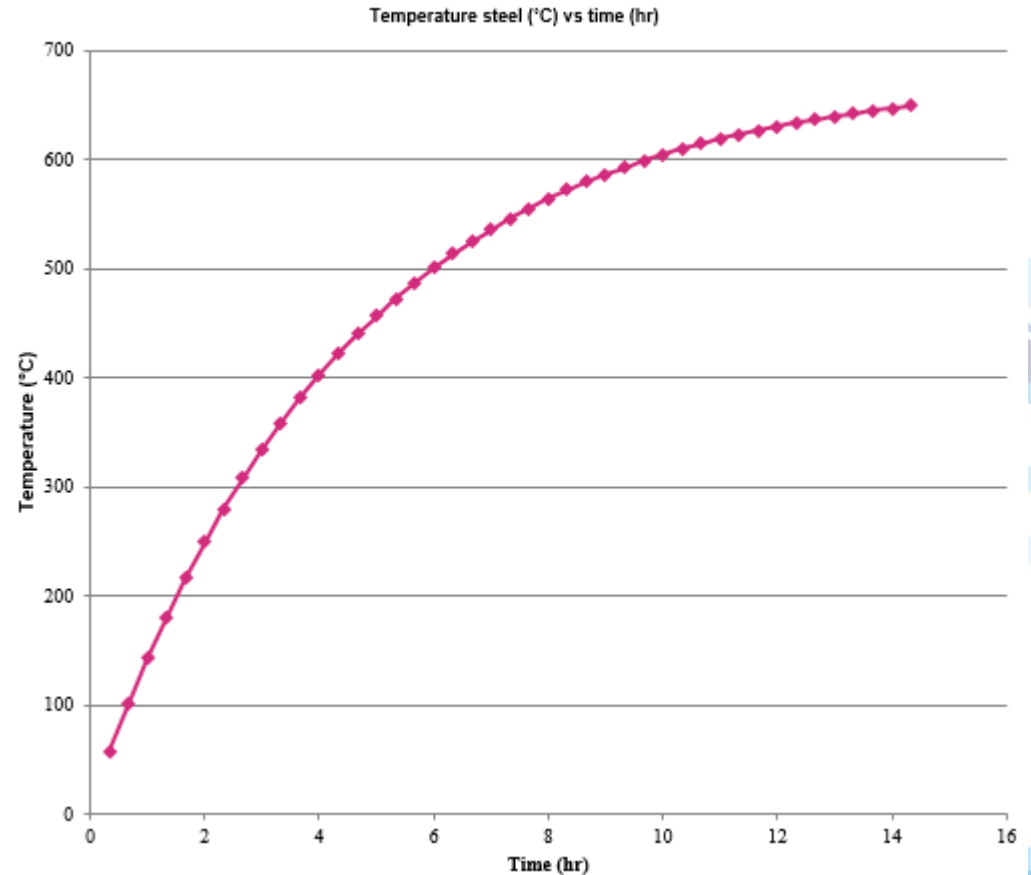


Results

Due to the short duration of the fire (approximately 4 minutes) and the maximum expected radiation heat flux at the surface of the steel (48 kW/m²), it is expected that integrity of the main structure of the area and the process installation will not be affected in case of a fire.

Interim conclusion

Therefor there is no need for sprinkler/deluge or other type of water based systems.



Safetycrete®

Open structure concrete
with an absorption capacity
of vol. 20%.

if connected to a
sewer/drain system the
absorption will be unlimited.



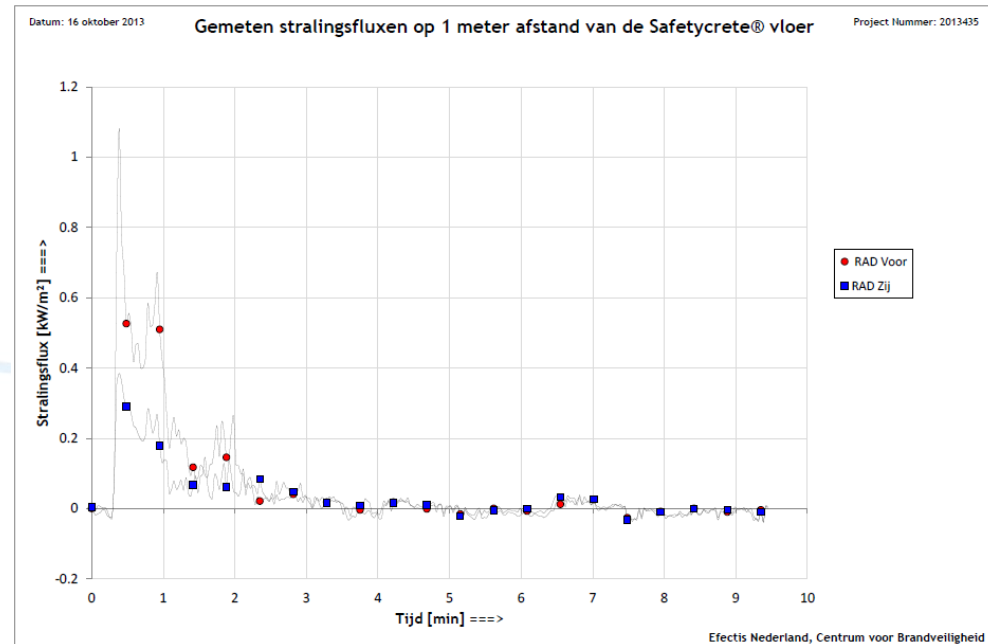
Results

- 200 liter absorption < 240 seconds
- Local flaming maximum 50 cm
- 30 sec. local flaming < 30 cm
- 45 sec. local flaming < 10 cm

- Maximum heat output 1.1 kW/m²

Interim conclusion

Therefore there is no need for sprinkler / deluge or other type of water based systems.



Final conclusion

- Process installations insulated with non-flammable insulation have a high level of passive fire protection.
- Safetycrete®, tests done by Efectis, show a heat release rate reduction of >90%.

In combination:

- Active fire suppression systems don't provide added value > economic consequences?
- Fire Safety Engineering gives you inside information what to expect in case of fire and which way is the most cost effective way to protect your buildings and process installations.

Gracias por su atención

Thanks for your attention

Willem Hamer
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Arup



Ayuntamiento de A Coruña
Concello da Coruña



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