EXPERIMENTAL STUDY OF THERMAL SHIELDING BY LIQUID FILM AND SPRAYS

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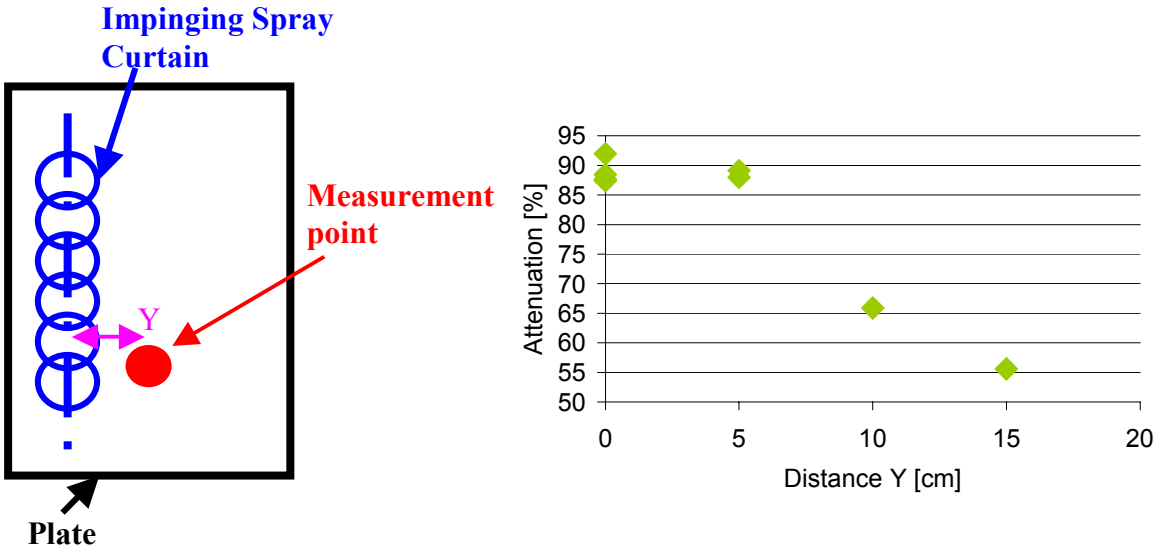
Nowadays, due to severe consequences of accidents, safety becomes more and more important and implies the need to design new mitigating devices. In the field of protection of petro-chemical storage tanks against infrared radiation from a fire, the water liquid film and the water spray curtain are recognised as efficient techniques.

In this project a new technique of "impinging sprays", combining the two mentioned above is studied by means of an experimental approach. A theoretical model enables to validate the measurement's procedure. Experiments are conducted successively for the liquid film, the sprays and the impinging sprays in the Water Spray Facility of the Von Karman Institute.

Results pointed out that for a given flow rate the attenuation is 40% for the liquid film, 30% for the vertical sprays and can reach 90% in the impact area of impinging sprays as shown in the figure. The technique of impinging sprays is hence the most efficient.



Attenuation's factor for Impinging Sprays Curtain
(Full cone TG03 300kPa nb=33/m Distance Sprays/Plate= 42cm)