



# Protecting Rolling Stock

Railway Interior Expo 2009  
Cologne, Germany

## PART 1



What is  
Water Mist?

## PART 2



Protecting  
Rolling Stock

## PART 3



Fire testing &  
Performances

**MARIGFF**

A UTC Fire & Security Company

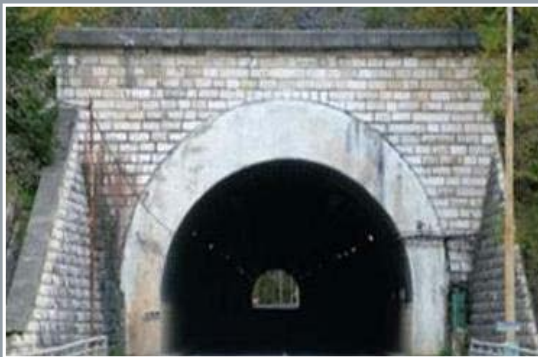
# Marioff Group



# Transportation & Infrastructure

## ”Protecting Your Entire Transportation Network”

- Road and Railway Tunnels
- Stations/Underground Facilities
- Rolling Stock





# PART 1

## What is Water-Mist ?



# What is Water-Mist ?

Basic principle



# What is Water-Mist ?

Basic principle

Water-mist is composed of

micro-droplets

sprayed at

high velocity



to the seat of the fire

# What is Water-Mist ?

## Basic principle

Fire is suppressed or extinguished by

the mist's large  
cooling surface

which  
gives

rapid vaporization

oxygen depletion

and

maximum  
absorption of  
radiant heat



# What is Water-Mist ? Principle of Operation

~~Oxygen~~



~~Heat~~

Combustibles

HI-FOG® water mist

**Provides efficient cooling as well as radiant heat blocking**

HI-FOG® water mist

**Evaporates efficiently thus providing local inerting at the heart of the fire**



# What is Water-Mist ?

Basic principle applied to Rolling Stock

using water  
efficiently

allows

water  
consumption to  
be minimized

for

weight/volume  
optimization

(ca. 90% less than conventional sprinkler systems)



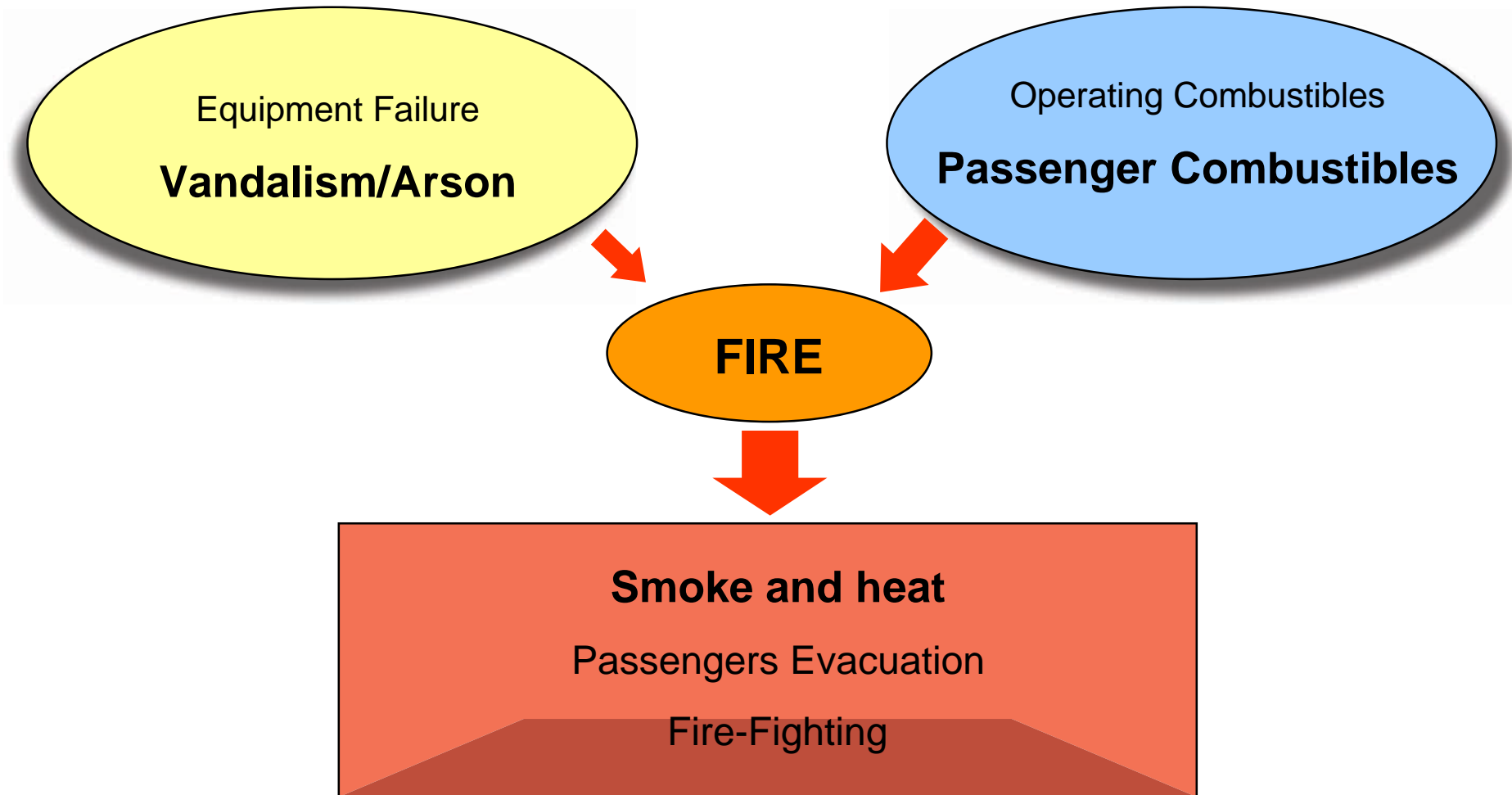


## PART 2

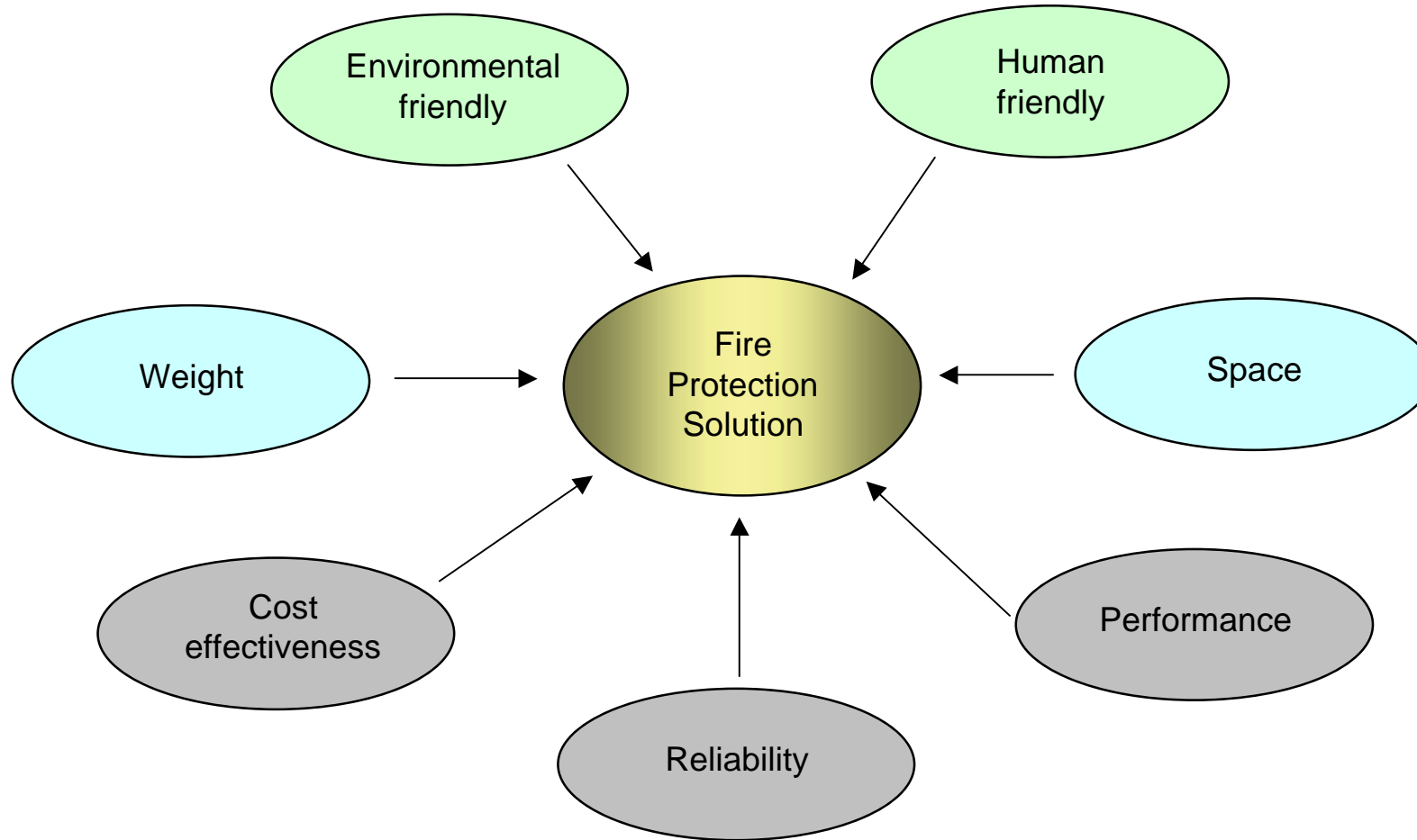
# Protecting Rolling Stock



## Specific risks for Rolling Stock



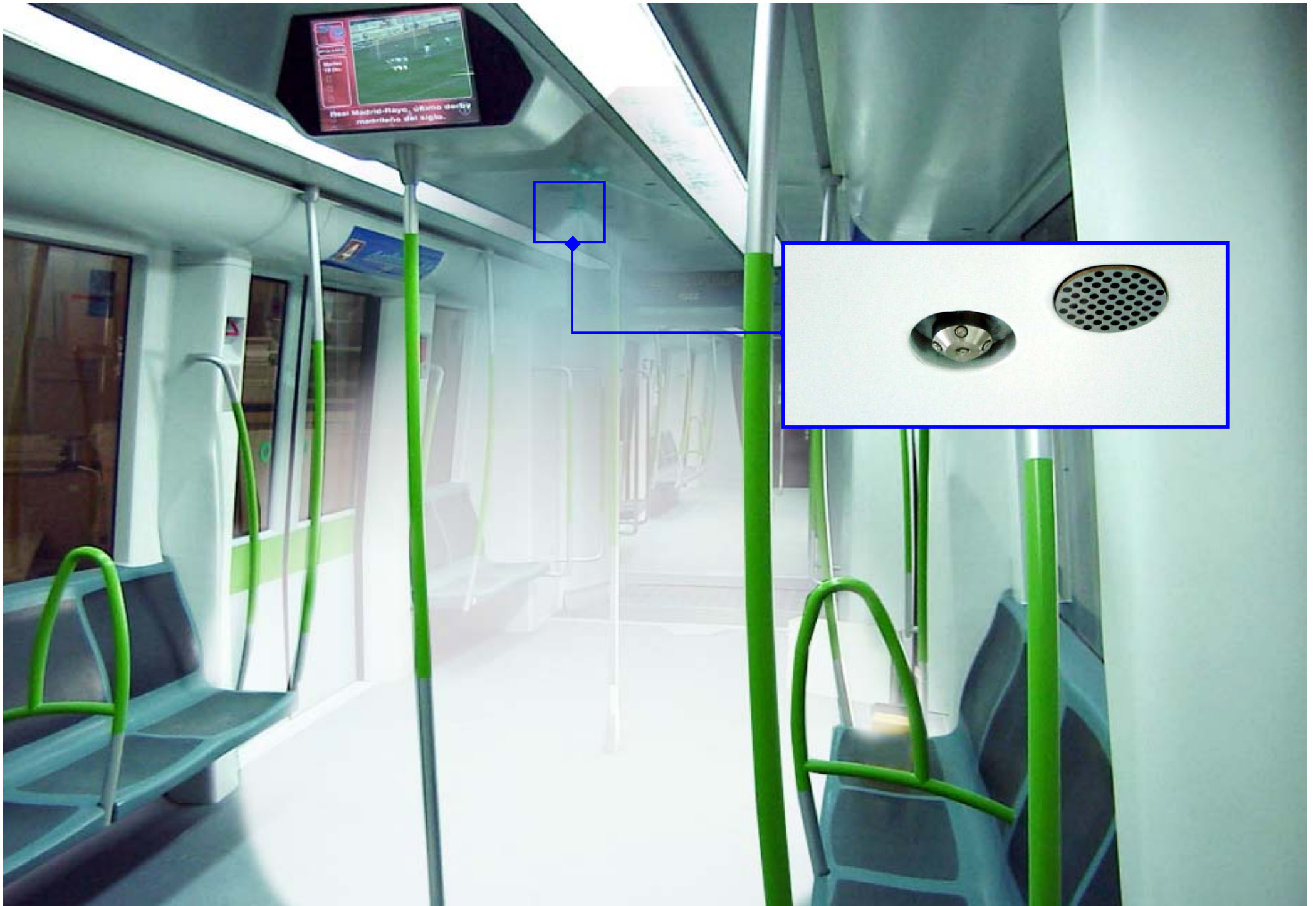
# Rolling Stock Specific Considerations



## Water-mist for Rolling Stock

- Fire detection system
- Water mist unit
- Actuation and section valves
- Specific Nozzles
- Thin tubing (12mm and 16mm)







## Fire protection of Rolling Stock



### HI-FOG® Water Mist benefits are:

- Fast discharge via fire detection system (Conventional, HSSD...)
- Suppress, control and extinguishment of fire
- Cooling of the gases and smoke reduction to more tenable conditions for evacuation of passengers and access to fire brigades
- Minimise damage to equipment and infrastructure
- Using only environmental/human friendly means (air, nitrogen, water)

***MOST SUITABLE FIRE-FIGHTING SOLUTION FOR RAILWAYS***



## PART 3

# Fire Testing for Rolling Stock



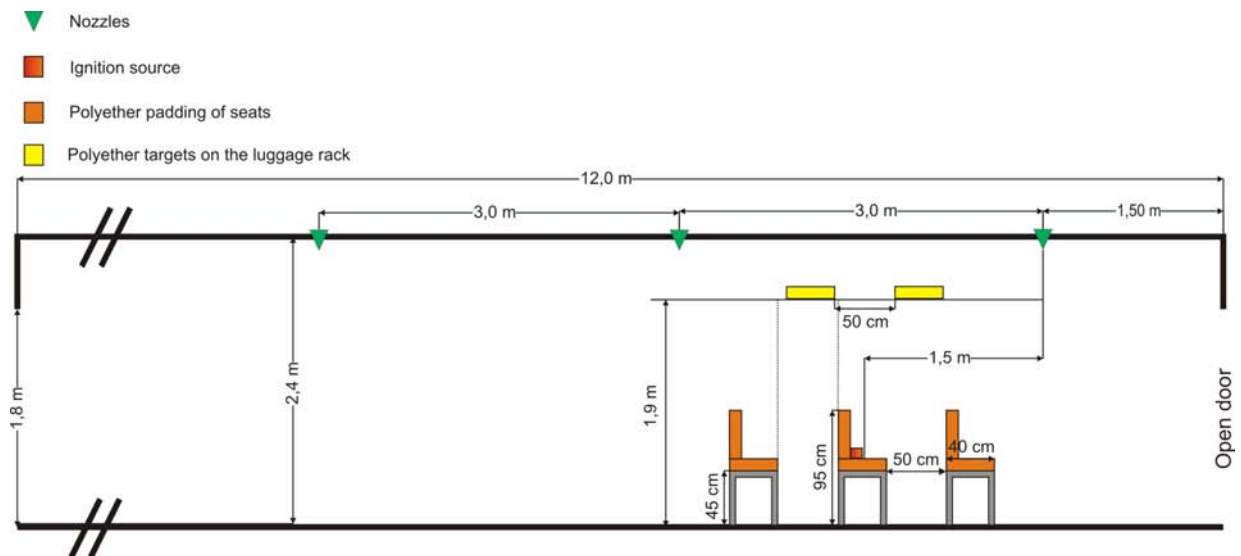


## Marioff believes in full-scale fire testing

### Performance-based approach:

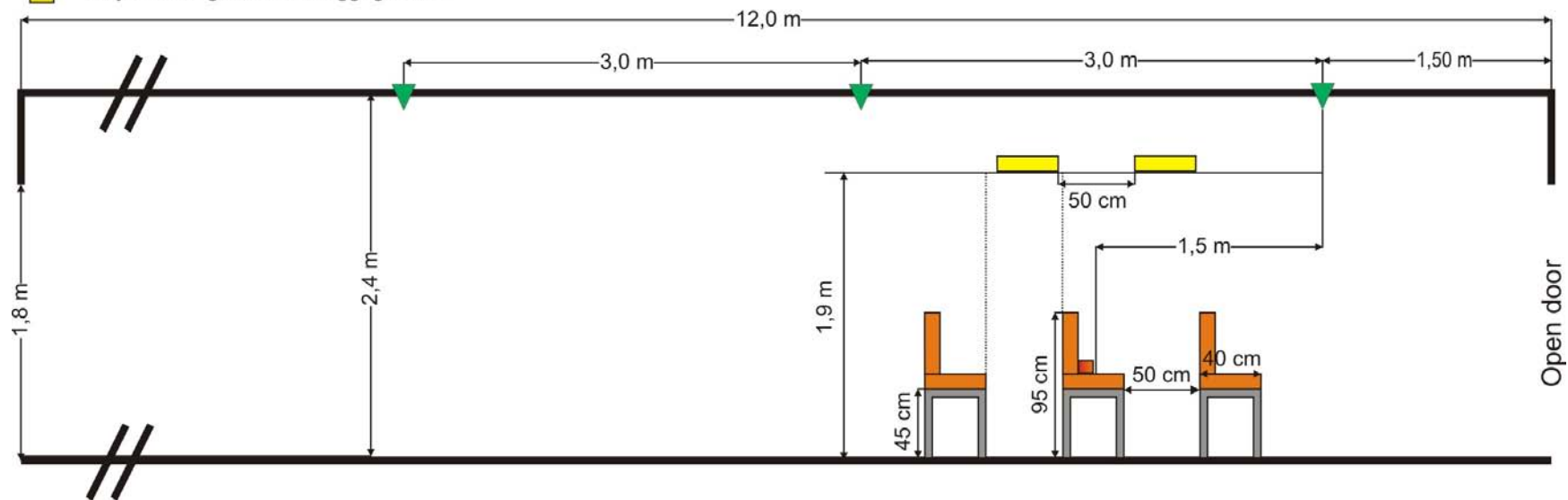
ALL water mist system designs and installation parameters are defined and confirmed in full-scale fire tests

- Nozzle type
- Operating pressure
- Flow rate
- Spacing
- Installation height

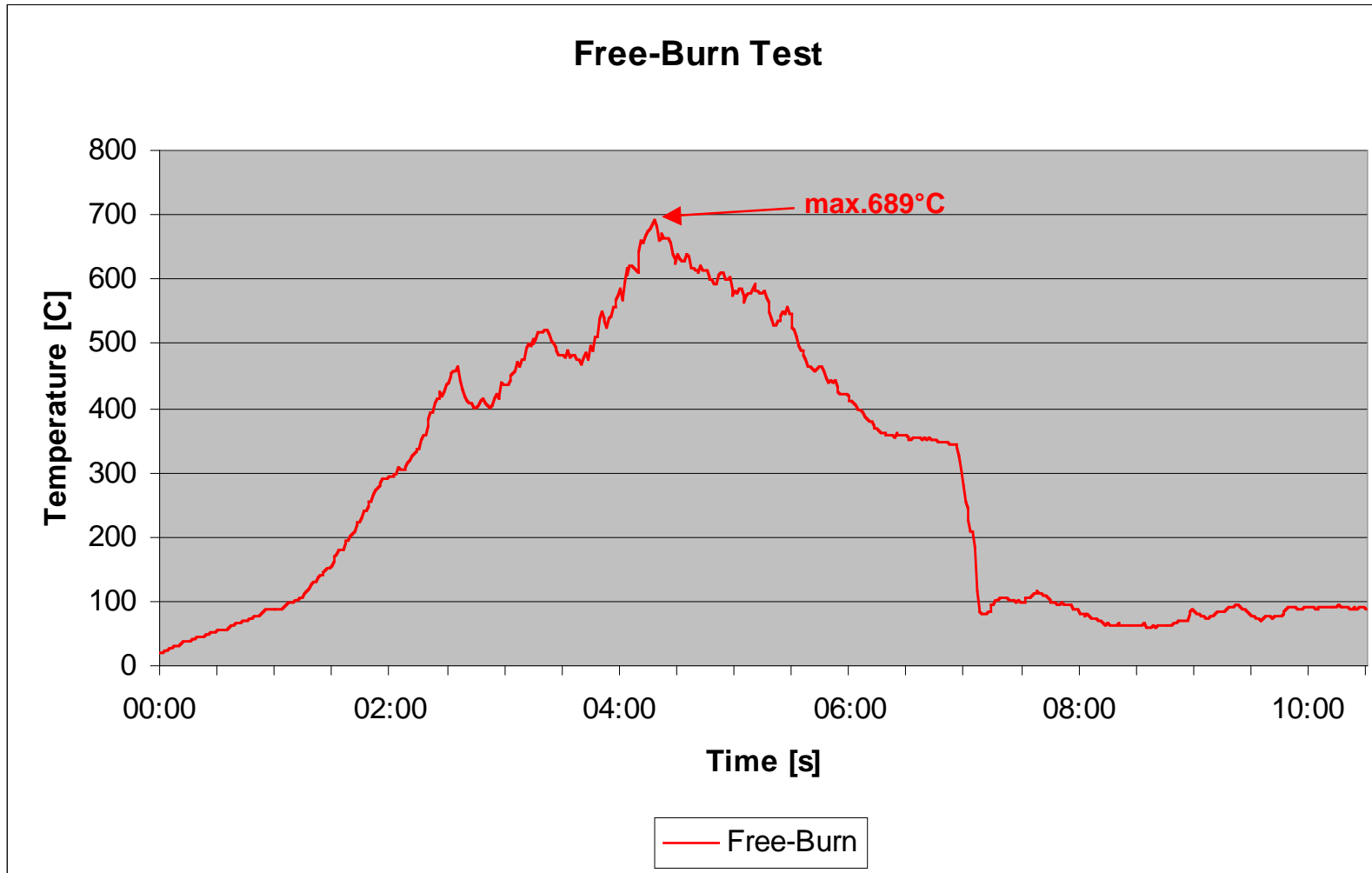


# Full-scale Fire Test

- ▼ Nozzles
- Ignition source
- Polyether padding of seats
- Polyether targets on the luggage rack



# Free-Burn



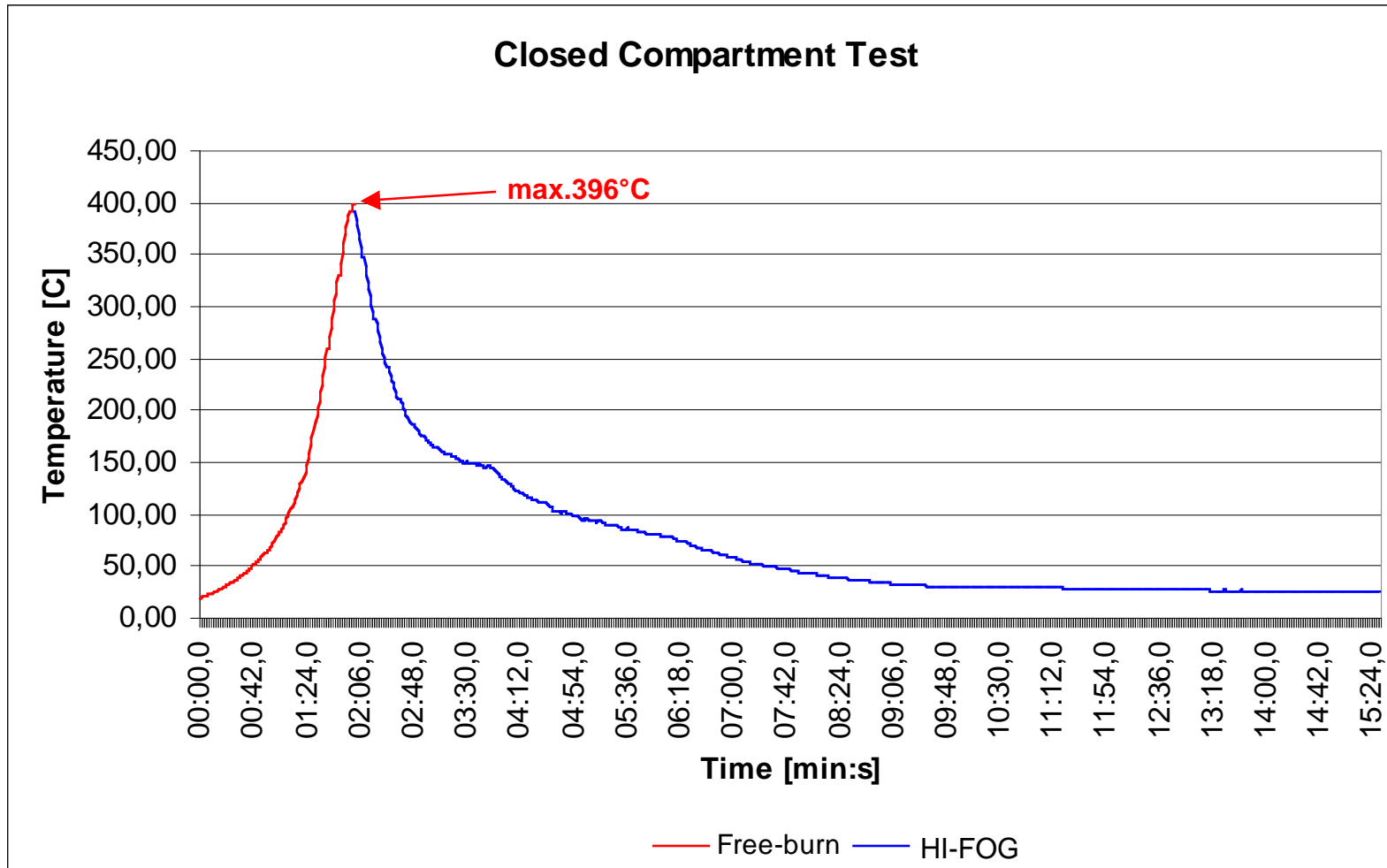
## Free-Burn



## Closed Compartment Performance



# Closed Compartment Performance





# Rolling Stock Protection Summary



HI-FOG® Water mist is most suitable active protection for passenger compartments

HI-FOG® Water mist is highly adaptable solution to all vehicles

HI-FOG® Water mist protects passengers and railway vehicles efficiently

HI-FOG® Water mist has already long track record in railway vehicles



You need this.



In case of fire, you don't need this.



**THANK YOU**



A UTC Fire & Security Company