



# FOGTEC<sup>®</sup> FIRE PROTECTION



# TUNNEL FIRE PROTECTION

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**Michele Barbagli**  
**Area Sales Manager Rail Systems**  
**FOGTEC Brandschutz**

## **Why firefighting in rolling stock?**

## Why firefighting in rolling stock?

**To increase safety**

**To reduce fire-related damage**

**To reduce fire-related unavailability**

**To protect people and investments from fire**

**To allow compensation measures on infrastructure**

**See e.g.:**

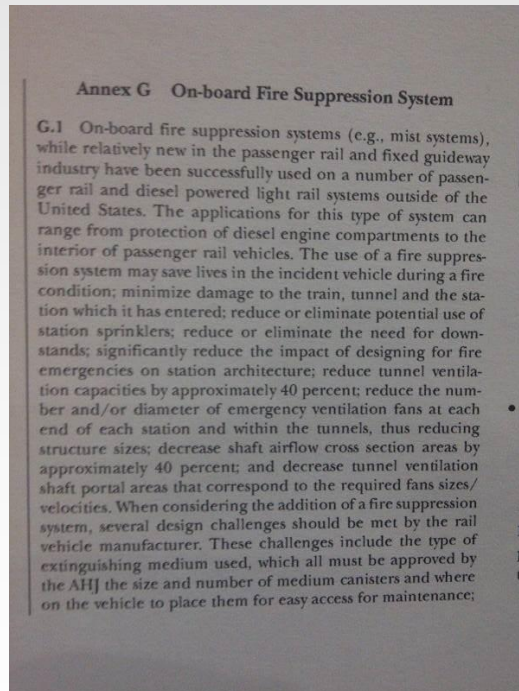
**NFPA130 Annex G**

**ARGE Guidelines**

**Italian Minister's Decree 28 „Safety in Railway Tunnels“ and UNI 11565**

## Why firefighting in rolling stock?

### NFPA130 Annex G: the new revision of 2014 introduces the advantages of using on-board suppression systems



The NFPA130 Annex G is the first standard to introduce the advantages of using on-board fire suppression systems for rolling stock!

## Why firefighting in rolling stock?

### NFPA130 Annex G

Extract from the Annex G:

„Fire Suppression Systems [...] have been successfully used on a number of rail systems outside of the US“

„The use of a fire suppression system may save lives in the incident vehicle during a fire condition“

„minimize the damage to the train, tunnel and station“

„significantly reduce the impact of designing for fire emergencies“

And many design improvements on underground infrastructure design...please refer to the „Smart Concepts“ to presentation

## Why firefighting in rolling stock?

### The ARGE Guidelines

Technical guidelines developed from the middle of years 2000 by a working group, led and under the supervision of TÜV Süd and TÜV Nord, of German speaking-area companies active in firefighting in rolling stock.

Widely applied all over the world and considered the „state of art“ of the technical requirements and guidelines for design and validation.

3 parts:

- Fire detection in railway vehicles
- Firefighting in railway vehicles
- System functionality of fire protection systems for railway vehicles

## Why firefighting in rolling stock?

### The Italian case – DM „Safety in Railway Tunnels“ and UNI 11565

A long and sad history of terrorism influenced nationwide public opinion and safety/security authorities:

- Summer of '69 train bombings
- Reggio Calabria riots and train bombings in '70-72
- Bologna Station bombing in 1980

Some particularly targeted trains in tunnels with , inside the 18.5km-long *Grande Galleria dell'Appennino*, with high death toll and nationwide shock:

- Train *Italicus*, 3 August 1974
- Train *Rapido 904*, 23 December 1984



## Why firefighting in rolling stock?

### The Italian case – DM „Safety in Railway Tunnels“ and UNI 11565

In beginning of years 2000, with the planning and opening of the new high speed lines (in particular the new Florence-Bologna HS line, 78km 73.5 of them in tunnels), the need of improved safety did rise strongly.

The DM „Safety in Railway Tunnels“ was released, introducing many requirements for safety and security:

- Escape routes in tunnels
- Quick reaction of rescue forces
- Access protection (surveillance etc.)
- **Introduction of the mandatory requirement of fixed firefighting systems in all rolling stock running in tunnels longer then 1km**

## Why firefighting in rolling stock?

### The Italian case – DM „Safety in Railway Tunnels“ and UNI 11565

For the technical application, the standard UNI11565 was put into force:

**UNI 11565 - RAILWAY VEHICLES - DESIGN, INSTALLATION, VALIDATION AND MAINTENANCE OF FIRE DETECTION AND EXTINGUISHING SYSTEMS TO BE USED IN RAIL VEHICLES**

Conceptually very similar to the ARGE Guidelines

## **Fire Protection systems for Rolling Stock applications**

## FOGTEC projects in Israel

### Refurbishments

Alstom PP Generator Wagons

Bombardier DD Generator Wagons  
(with fire tests)

### New trains

Bombardier DD (new generations)

Vossloh EURO locomotives



## Contents

- **Technologies**
  - **For passenger areas**
  - **For technical areas**

## Contents

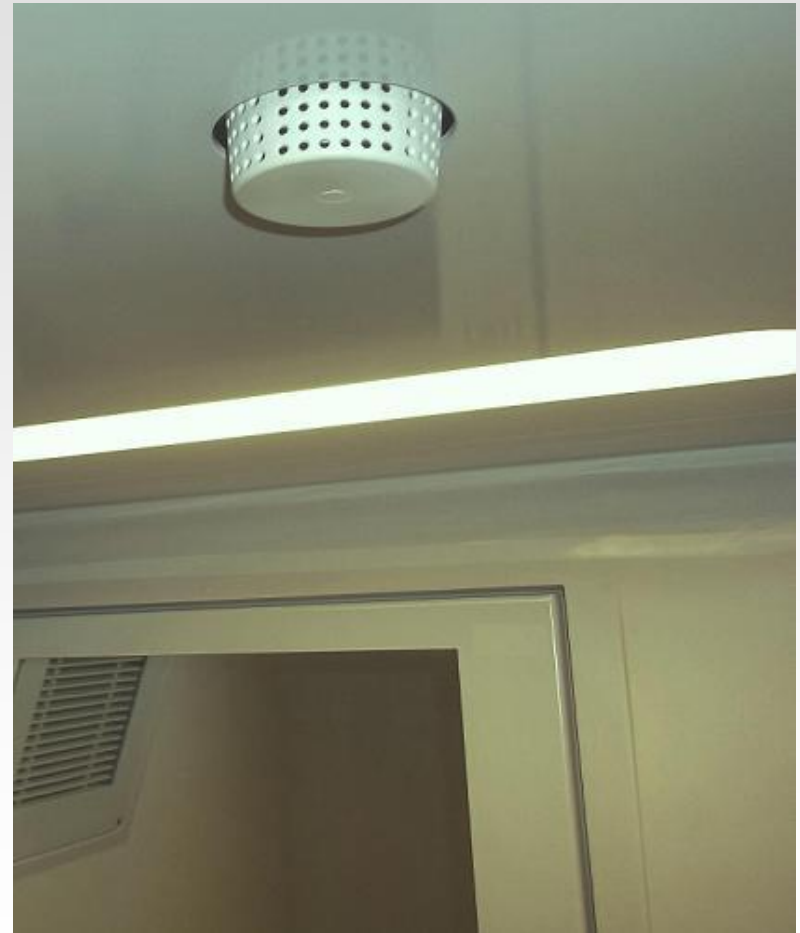
- **Technologies**
  - **For passenger areas**
  - For technical areas

## Passenger areas

### Smoke detection technology

- Smoke is the first effect of a fire.
- In an enclosed area as a passenger wagon, detecting fire by temperature means detecting it too late.
- By point detectors or by smoke aspiration systems

Temperature detection: can be used in combination in „extreme“ conditions



## Passenger areas

### Firefighting by high pressure water mist

Video 1



Video 2



## Contents

- **Technologies**
  - For passenger areas
  - **For technical areas**

## Technical areas

- Linear Heat Detector  
LHD
- Temperature detection
- Maintenance free  
component
- Robust in harsh  
environmental conditions



## Technical areas

- Infra-red mini triple IR (IR3) Flame Detector
- Very quick flame detection
- Special version with metal housing for harsh environments
- Tested at Israel stat rail's fire test



## Technical areas

### Firefighting by high pressure water mist



**Video 4**

## Technical areas

### Aerosol systems

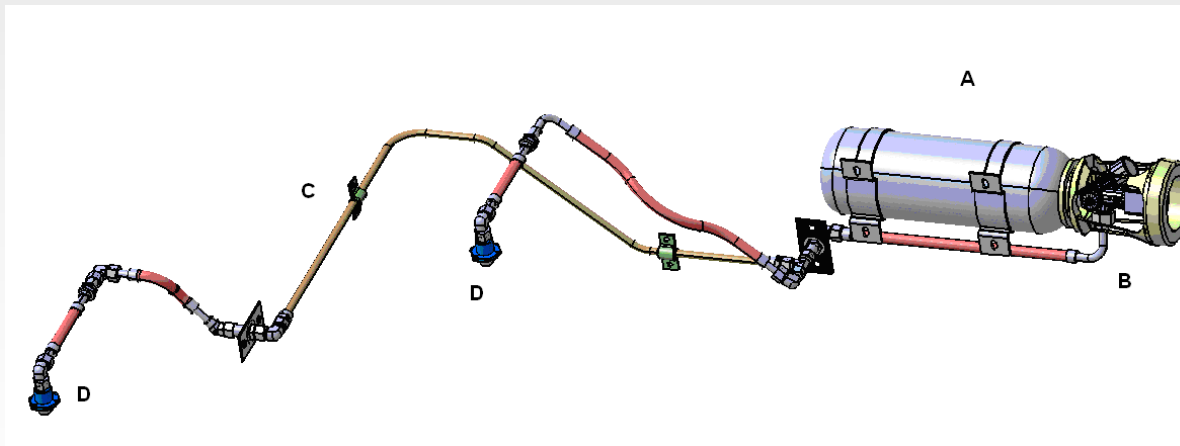


**Video**

## Technical areas

### Nitrogen systems

„total flooding concept“ applicable only to enclosed electrical cabinets



**Thank you very much for your kind attention !**

