Fire protection for rolling stock
Innovative solutions from Siemens Building Technologies
Fire protection for trains

Fire safety is essential for railway safety. In the event of a fire, a train must be able to reach an appropriate evacuation location to protect people, goods and installations. Most of all, it must also be able to brake. Although passive protection (fire protection of the engine compartment partitions, driver protection, fire resistance of passenger cars, protection of pipes and cables) has proven its effectiveness, automatic fire detection has become an essential aspect of a comprehensive fire safety concept. This is especially the case for train traffic through tunnels and more generally in non-secured areas.

Early fire detection enables the train staff to react quickly and initiate correct measures. But the system must also be credible. Without innovative technology used correctly, an environment with deceptive phenomena can lead to false alarms. Our solutions distinguish between real fire and deceptive phenomena. In a changing world, the assistance of innovative technologies ensures reliable and lasting protection. Siemens develops solutions specific to rolling stock in compliance with European regulations.

Risks and expectations

Fire protection portfolio from Siemens
Our fire protection portfolio includes solutions that:
– quickly detect a fire before it can spread,
– provide clear, precise and relevant instructions to ensure the safety of passengers and staff and
– are easy to maintain over time, ensuring that they remain in perfect working order.

Meeting all expectations
Whether you are a rolling stock manufacturer or train operator, our fire safety solutions for rolling stock meet all your expectations.
As a rolling stock manufacturer, you want to:
– purchase reliable, turnkey solutions with associated services,
– supply and easily integrate products and systems and
– use products and systems that completely fulfill current standards.

As a train operator, you want to:
– ensure continuous and flexible operation by using high-performance systems,
– efficiently manage the availability of your rolling stock,
– optimize operating and operational costs and
– ensure the highest level of safety for passengers and staff.

Protecting lives and assets
Backed by our expertise in the field of fire protection, we offer you innovative and lasting solutions for all areas at risk on a train, including the driver’s cab, luggage compartments, restrooms, locomotive, power transformer, galley, sleeping cars, etc. Our detection system covers all types of fires: for example, cable fires, fires of electrical origin, fuel fires and, of course, luggage fires.

Our portfolio of advanced fire safety solutions encompasses intelligent fire protection for rolling stock like high-speed trains, locomotives and metro lines.
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The light sources (scattering and backscattering angles) allow the homogeneous detection of the light and dark particles. The labyrinth (D) absorbs the light emitted by the two light sources and so prevents unwanted reflections. The special layout of these two light sources and so prevents unwanted reflections. The ambient temperature is measured by four redundant temperature sensors (E).

It also combines temperature criteria with optical signals to adjust its sensitivity in the event of a flaming fire and to detect fires that do not produce smoke.

The fire control panel FC801-AA provides the software to operate, monitor and diagnose the fire protection system as well as the power supply for all connected system components. Other features include:

- Centralization of detector management
- Safe by design (SIL2-EN 50126) – to guarantee system availability
- Flexible and standardized – up to eight zones and up to 32 detectors, fits existent and future platforms, minimized integration and cabling efforts
- Separate fire detection zones and individual status information
- Communication with train control system (Ethernet)

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**Highlights**

- Ideal detector for rolling stock
- Based on our reliable detection technology and extensive experience in the aviation field, we have developed the multisensor smoke/heat detector FDDOT801. Its benefits include:
  - Very low false alarm level from deceptive phenomena like fog/haze, condensation, dust particles, exhaust fumes, etc.
  - Easy planning, cabling and installation
  - Simplified fire risk management
  - Enhanced availability

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- Powerful detection algorithm FDDOT801 has a powerful detection algorithm. Its parameters adjust themselves to specific environmental conditions — maximizing safety.

- Flexible and standardized
  - With its plug-and-play configuration, FDDOT801 is easy to plan, install and commission. It also provides:
    - Two fire peripheral inputs — to manage linear heat detectors or manual call points
    - One fire protection output — to manage fire extinguishing equipment, an alarm sounder or a beacon

**Multisensor fire detector**

**Fire safety system**

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Fire protection on vehicles — EN 45545 and EN 50553
The objective of the measures and requirements specified in the European Standard EN 45545 is to protect passengers and staff in railway vehicles in the event of a fire on board.

The European Standard EN 50553 specifies the requirements for running capability in case of a fire on board any rolling stock. Among others, the standard describes the detection performance in the passenger or staff areas as well as in high-power equipment compartments (both diesel and electric).

Compliant with EN 54
According to the Construction Product Directive 89/106/EEC, it is mandatory that fire detection and fire alarm components are certified under Standard EN 54 by an authorized certification body. Our fire safety solution for rolling stock complies with all European regulations and guidelines: EN 54-part 7 (smoke detectors), EN 54-part 5 (heat detectors), EN 50155 (railway applications, electronic equipment used on rolling stock).

Regulations and guidelines

Due to the interoperability of rolling stock, the rail landscape has changed over the years. Interoperability is the capacity of a rail system to allow trains to run safely and seamlessly. A “cross-border” fire safety standard for the materials used in vehicles is becoming an absolute necessity.

Safety management systems in railways projects — EN 50126
The European Standard EN 50126 is applied systematically by a railway authority and railway support industry, throughout all phases of the life cycle of a railway application, to develop railway-specific RAMS (Reliability, Availability, Maintainability and Safety) requirements.

Safety-relevant software in railway stock — EN 50128
The European Standard EN 50128 specifies the process and technical requirements for the development of software for programmable electronic systems for use in railway control and protection applications.

Welcome to the world of innovative thinking

Innovation power and excellence
Siemens makes massive investments in both manpower and research and development. This results in a steady stream of new insights, technologies and inventions that enable us to improve the reliability of our products, systems and solutions for the protection of people and assets. Relying on the highest standards in automatic production processes makes a significant contribution to protecting the environment.

Siemens is at the leading edge of progress in fire safety — and continues to redefine both current and future technologies.

A reliable partner
With Siemens, you are in the very best of hands: Backed by a history of over one-hundred years, Siemens is an established and reliable partner. Innovative products, systems, intelligent solutions and value-added services from Siemens offer you complete fire protection. Today, tomorrow and for decades to come. As our history shows, our understanding of sustainability is closely linked to our company values — responsible, excellent and innovative.

Understanding fire safety
Fire safety today requires a comprehensive understanding of needs and innovative solutions. As a leading international provider of fire safety technology — especially in the aeronautics sector with the first centralized smoke detection system launched on airliners — we have learned how fire protection works most effectively. This knowledge has contributed to the development of our innovative, high-quality fire safety products, systems and solutions for rolling stock.

Services by Siemens
From planning to maintenance, we are at your side every step of the way. We support you during the system design process, including system architecture, layout plan and safety plan according to EN 50129. After installation, we inspect and test the system — including the first approval inspection at the supplier’s facilities, equipment factory acceptance testing, static tests, dynamic tests and commissioning on the first train set. We also provide technical assistance and training.

Backed by 160 years of in-depth expertise and field experience, we know how fires work. We were the first manufacturer to offer automatic fire detectors. With more than 400 highly experienced employees working in research and development, we will continue to set the pace.

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Answers for infrastructure and cities.

Our world is undergoing changes that force us to think in new ways: demographic change, urbanization, global warming and resource shortages. Maximum efficiency has top priority – and not only where energy is concerned. In addition, we need to increase comfort for the well-being of users. Also, our need for safety and security is constantly growing. For our customers, success is defined by how well they manage these challenges. Siemens has the answers.

“We are the trusted technology partner for energy-efficient, safe and secure buildings and infrastructure.”