

Special edition 2016

Rail News

WAGNER® 
Impulse

The WAGNER Rail Customer Magazine
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COVER STORY

Gotthard Base Tunnel

Setting new standards in fire protection

» WE'RE GOING ABROAD WITH OUR RAIL CUSTOMERS

Interview with
Dr. Markus Müller

NON-STOP TRAVEL – EVEN IF EXTINGUISHING IS TRIGGERED

Compact water mist extinguishing system for small passenger areas

CURRENT TRENDS IN THE RAIL INDUSTRY

Expert forum



Dear Readers and Business Partners,

the railway remains one of the safest and most environmentally friendly means of transport in the world – for passenger and freight transport alike. And yet the railway business is becoming increasingly complex and international. Competitive pressure and rising traffic volumes require absolutely dependable operation. Cutting-edge safety equipment, especially reliable fire prevention systems, are now essential. Our latest innovations, the compact water mist extinguishing system and the multi-dimensional air sampling smoke detection system TITANUS MULTI-SENS®, are solutions which prevent operational interruptions caused by false alarms, putting them right on the pulse of the times.

You can find out more about this in this issue of the Rail News, as well as about international projects which we have completed with our customers using our established know-how based on over 15 years of practical experience with our customers.

Sincerely, Dr. Markus Müller
Managing Director of WAGNER Schweiz AG



No more hold-ups caused by smokers in the toilet

Self-contained water mist compact system for WCs and small passenger areas

Experience has shown that one of the most common causes for a fire alarm in the passenger area is smoking in WCs in violation of the rules. In many cases, it doesn't stop with the alarm going off, it can also trigger the fire extinguishing system in the WC, which depletes the water supply. Sufficient fire protection for the passengers can then no longer be guaranteed once the water supply has been exhausted. This means the train will have to stop at the next railway station and passengers will have to be evacuated.



THE NEW BROCHURE ON FIRE PROTECTION IN RAILWAY APPLICATIONS

► Now available at www.wagner-rail.com



▲ The dual-chamber construction of the extinguishing cylinder is easily recognisable in cross section (highly compressed nitrogen in the inner chamber; extinguishing water in the outer chamber)

This is where the new water mist compact system from WAGNER comes into play. This new development, the result of collaboration with Rotarex, provides a solution which remedies this situation. Unlike conventional fire extinguishing systems, the water mist compact system is self-contained and designed specifically for small areas. If smoke is detected in a WC, only the compact system will be triggered, since it is equipped with a separate extinguishing cylinder. The train will retain the rest of its extinguishing agent supply. The WC can then be blocked, leaving nothing to prevent the train from continuing onward. In functional terms, the system consists of a smoke alarm such

as a TITANUS® air sampling smoke detector, which continuously takes air samples from the WC and performs highly sensitive analyses for smoke particles. The second component is a cylinder of extinguishing water. This extinguishing cylinder features a dual-chamber design: the inner chamber contains nitrogen compressed at 200 bar which serves as the propellant for the extinguishing operation. The outer, larger chamber is charged with extinguishing water. WAGNER offers the compact fire suppression system in three sizes with 4, 7 and 12 litres of extinguishing water. The dual-chamber construction offers many advantages: it makes the extinguishing cylinder less sensitive to vibration and impacts, keeps the high-pressure propellant well-protected and allows the extinguishing cylinder to be installed horizontally as well as vertically. This means that the system can be adapted to perfectly match any type of rail carriage design. If the alarm detects fire aerosol particles in the WC, it sends a signal via a train-bus to the fire detection control panel, which then activates the water mist compact system. The extinguishing water is sprayed into the WC as a fine mist at a pressure of 35 bar. After having been triggered, the system is easy and inexpensive to replace with an operative system, and the old system can then be refilled. This self-contained compact solution means that a train will

Benefits to the operator

- Extinguishing in the WC does not interrupt travel
- Passenger access only blocked to the room affected
- The water mist extinguishing system remains fully functional in the rest of the passenger area
- Significantly reduces operating costs
- Reduces downtime

Specifications extinguishing cylinder

- Volume: 4 | 7 | 12 litres
- Length: 385 | 566 | 830 mm
- Diameter: 190 mm
- Weight (full): 11 | 20 | 37 kg
- Approved temperature range -35°C to +80°C
- Cylinder pressure: 20 bar at 20°C
- Discharge pressure: 35 bar
- Extinguishing agent: Water + additive

no longer be brought to a standstill by people breaking the rules by smoking in the WC. ■



Gotthard Base Tunnel

Setting new standards in fire protection

Swiss Federal President Johann Schneider-Ammann introduced the opening of the new Gotthard Base Tunnel with a “Make way” speech on 1 June 2016: This marks the successful, on-schedule completion of the gargantuan, 17-year project: The tunnel, which is part of the large-scale Swiss project NEAT (Neue Eisenbahn-Alpentaversale – New Transalp Railway), is 57 km long, making it the longest railway tunnel in the world with the largest rock covering worldwide of approx. 2,300 m.

With the opening of the Gotthard Base Tunnel, Europe is ushering in a new era of rail transportation. Considered a technical masterpiece, the tunnel makes up the heart of the newly built rail line between northern and southern Europe. It connects the industrial centres of Belgium, Germany, Italy, the Netherlands and Switzerland. Between 700 million and 1 billion tons of freight roll down these tracks each year, which is more than half of the entire freight traffic between north and south in the EU. Thanks to the Gotthard Base Tunnel, the Alps – the number one obstacle to transportation in Europe – are no longer a problem.

New standards in safety and fire protection

The Gotthard Base Tunnel has state-of-the-art safety equipment to protect passengers, personnel and the tunnel structure. A variety of train monitoring devices serve to detect defects with the trains at an early stage before the trains enter the tunnel. The main tunnel has exits into subsidiary tunnels every 325 metres, ensuring rapid access to a secured space. Emergency lighting, handrails and signage make it easy to guide travellers to safety. The trains running through the tunnel are also subject to heightened security standards. Specific network access conditions which also call for increased fire protection were introduced for this in 2013. So the Swiss Federal Railways (Schweizerische Bundesbahn – SBB) are retrofitting their trains accordingly. WAGNER, one of the leading fire protection experts, is providing the right solution for the type Re 460 locomotive.

Fire protection concept

WAGNER won over its customer in a public tender with its dependable fire protection system. The machine rooms of the locomotives will be fitted with TITANUS® air sampling smoke detectors. They detect smoke up to 2,000 times

faster than conventional point-type detectors by actively taking air samples from the protected area and analysing them. In addition, linear heat detectors for fire detection are installed on the exterior as well as below the floors and in the ceilings. The data from the detection units are transmitted to a central fire panel which is responsible for the fire control system and forwarding the alarm. Optical and acoustic alarm units are installed in the driver’s cabs of the locomotives. This allows the engine driver to locate the source of the fire immediately and take counter-measures if necessary. ■

57 kilometres long

2,300 meters deep

28.2 million m³ of excavated material

2,400 workers

410 metre long tunnel drilling machine

17 year construction period

€ **11** billion in expenses

325 trains per day

Trouble-free sleep

Top fire protection for sleeping cars in Azerbaijan

Travellers in the new Azerbaijani sleeping car can lean back, relax and enjoy their trip to the Orient – WAGNER's comprehensive fire protection solution ensures maximum safety.

Swiss rail vehicle manufacturer Stadler Altenrhein AG is building new rail vehicles for ADY, the Azerbaijani railway. In planning are 30 sleeping and dining cars with high-grade furnishings for transportation on international routes between Azerbaijan, Georgia and Turkey.

And fire protection solutions from WAGNER are on board too! The seating and dining area of the dining car will be equipped with a high-sensitivity air-sampling smoke detector from the TITANUS® family. The system continuously samples the air to identify even the tiniest particles of smoke, thus detecting a fire in its earliest stage of develop-

ment. Integrated LOGIC-SENS technology makes the system immune to false alarms, which is essential, especially in dining cars.

The ends of the car are each equipped with a nitrogen gas extinguishing system on the one hand, and an aerosol extinguishing system on the other. This ensures residue-free extinguishing within seconds in case of fire. Large-area point-type detectors with base sounders are installed in the cabin and WCs.

With this comprehensive fire protection concept, WAGNER offers tailor-made all-round protection for all areas. ■



▲ Sleep safely from Baku to Istanbul

Straight through Europe at 230 km/h

The cutting-edge high-speed fleet of the Austrian Federal Railways (ÖBB) is being supplemented by nine more 7-piece long-distance passenger trains. Also on board: a tailor-made fire protection system.

High-sensitivity TITANUS MICRO-SENS® air sampling smoke detectors continuously check the passenger area and the air-conditioning system's outside air monitor. Point-type detectors have additionally been installed to provide the necessary dual detector dependency in order to activate the automatic extinguishing system

in case of fire. If a fire is detected, the installed water mist extinguishing system will be triggered using a space-saving 100-litre water tank. In order to make sure this quantity of water will be sufficient, the passenger area is firstly subdivided into three zones: the WC, the entrance, and the two passenger areas. Secondly, water misting takes place at low pressure. While conventional systems require an operating pressure of over 100 bar, this system produces a comparable extinguishing effect at only 8–10 bar by adding a small volume of nitrogen to the extinguishing agent at the nozzle thus creating a very

fine water mist. The benefit: it saves space and is absolutely effective.

Other components of the fire protection solution include point-type detectors for monitoring the electrical cabinets in the driver's cabin, as well as gas extinguishing systems in the technical container under the floor. ■



» Our business focuses on fire alarm technology – the roots of the WAGNER Group

Interview with Dr. Markus Müller

Dr. Markus Müller, Managing Director of WAGNER Schweiz and President of EUROFEU tells us about the structure of the fire protection portfolio for rail applications and the benefits for the customers and gives a preview of the new products for the InnoTrans 2016 in Berlin.

WAGNER has been active in rail transportation for over 15 years – why are you planning to establish a separate WAGNER Rail GmbH now?

Primarily for strategic reasons, since the railway business is quite different from our typical project business in system construction for systematic fire prevention in buildings. These projects are generally completed in less than one year. Railway projects are more complex, international and can run for as many as five or six

years. This means we have obligations for service and maintenance and must be able to supply replacement parts for 30 or sometimes even 40 years.

What do your customers benefit from?

We are creating an organisation of rail experts who exclusively handle sales, customer support and the technical implementation of railway-specific fire protection solutions, which will subsequently also be provided with servicing and maintenance. And this entails an international approach to make it easier for us to support our customers to different countries. We coordinate our structures and processes to suit international markets so that we can continue to grow. It is our clear goal with our new approach to gain further system house

as customers and double our turnover in the next five to seven years.

What are the special challenges in the rail business at present?

In the past, fire protection projects used to be relatively simple projects. Today, the complexity of these projects is increasing rapidly, and along with it, the engineering requirements for us as fire protection engineers. It is becoming more and more important to cooperate with the system house in planning the integration of our technology and components in a new vehicle and thus better integrate the systems in the train bus system.



What will be the focus of your appearance at InnoTrans?

We will be presenting our classic portfolio at InnoTrans and many new products, such as a new control panel with integrated Ethernet connection and a self-contained water mist system for small areas such as WCs. And we will be presenting a fire alarm system which is specifically adapted for rail vehicles and is capable of distinguishing combustion smoke from cigarette smoke. This is of particular interest for WCs, where many alarms are triggered by smokers. This means we can present entirely new alarm concepts for trains. ■

**Dr. Markus Müller,
Managing Director of
WAGNER Schweiz AG**

- President of EUROFEU since 2015 (European Committee of the Manufacturers of Fire Protection Equipment and Fire Fighting Vehicles)
- Managing Director and partner of WAGNER Schweiz AG since 2007
- 10 years of experience at Cerberus and Siemens (Switzerland and France) as product and business manager for gas extinguishing systems and special fire alarms
- Doctorate in mechanical engineering and process technology at the Swiss Federal Institute of Technology in Zurich
- Course of studies in economics at the University of St. Gallen

Safe travel on the rails thanks to earliest possible fire detection

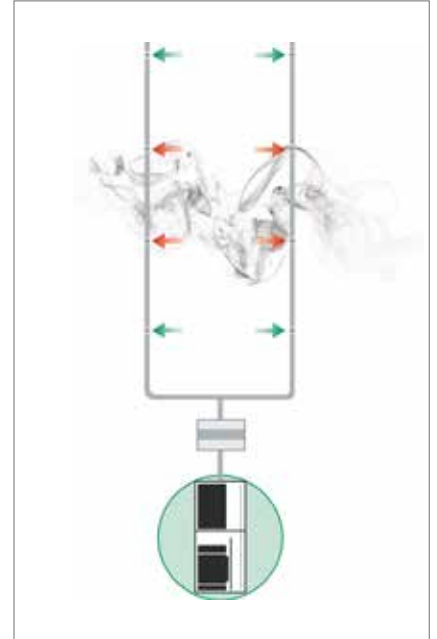
Early smoke detection is crucial in rail transport

Air sampling smoke detection systems have proven themselves on the rails because they detect the minutest smoke particles before flames appear, i.e. in the pyrolysis phase. To do so, they continuously take samples from the ambient air, thus enabling highly sensitive fire detection at the earliest possible stage. They are also designed to be vandal-proof.

TITANUS® family air sampling smoke detectors from WAGNER are distinguished by their maximum activation sensitivity (Class A as per EN 54-20). And they are immune to false alarms thanks to their patented integrated

LOGIC-SENS technology. The TITANUS MULTI-SENS® takes a gigantic leap forward: It can tell what is and isn't a fire. Thanks to an innovative new optical detection method, it can distinguish between harmless cigarette smoke and dangerously burning plastic.

This means that polluted ambient air, dust or passengers smoking cigarettes no longer set off false alarms or even trigger extinguishing systems. ■



▲ The sampling pipes are laid in suspended ceilings so that the necessary air sampling points are virtually invisible.

NEW PRODUCTS IN FIRE ALARM TECHNOLOGY

New fire detection systems

AOA Apparatebau Gauting GmbH has been well known for its cutting-edge fire alarm systems in aviation and rail transports for many years.

From individual smoke alarms and control units for the entire fire alarm system through to a single fire detection control panel: the spectrum of individually adaptable solutions is wide and meets the specific safety requirements for rail transport in any situation. AOA fire detectors can be used autonomously or, when connected with a CAN bus data line, as part of a complete fire detection and sup-

pression system. At its heart is the new fire detection control panel approved as per EN 50128 and EN 50129 SIL-2, which can control and monitor two loops with 32 addressable loop elements each via an internal CAN bus. In case of an alarm, the train and engine driver can be informed and locate the source of the fire and activate the WAGNER fire suppression system technology. Also new is the AOA fire and smoke detector which is immune to false alarms caused by interference such as dust, insecticides and sprays. ■

Current trends in the rail industry



The railway industry is developing rapidly and is becoming increasingly demanding. Higher competitive pressure, increasing requirements for rail operators and the trend towards more efficient infrastructure are increasing the need for new technologies. And safety equipment plays a central role here. Read about current trends in the rail business, new technologies and current challenges in our expert forum.

Frank Ostertag

Editorial staff Kuhn Fachverlag GmbH & Co. KG

A constant and ongoing trend concerns provision of the best possible combination of rail, bus, rental cars, E-bike stations, etc. tailored local requirements.

This multi-modal mobility is intended to “get by” wherever possible without having to use one’s own individual means of transport. Much progress has already been made in this field but there is still plenty of potential for improvements and new ideas. The promise from 2009 also offers room for improvement: “High-speed broadband internet for everyone” – a mega-trend, but the railway industry is setting it into motion too slowly. ■



The main keywords here are more variable drive concepts and load-dependent operating concepts.

Prof. Dr. Peter Gratzfeld,
Chair for Railway System Technology
University Karlsruhe

» **Public transport is required to become more efficient and cover greater areas while safety is to be increased and costs reduced wherever possible at the same time. This is like trying to square a circle!**

Michaela Stöckli,
General Manager of SWISSRAIL
Industry Association



Prof. Dr. Peter Gratzfeld
Chair for Railway System Technology
University Karlsruhe

The railway remains the safest and most environmentally friendly means of transport. And this applies equally to passenger and freight transport. This makes it all the more important to increase political support for rail transport and refine its technology.

Fire protection is very important here. The railway owes its high level of safety not least to first-class fire protection. This is particularly important for the many forms of transportation that take place in tunnels (such as underground rail) and many sections of high-speed transit.

Conservative use of energy is another trend: more variable drive concepts and load-dependent operating concepts are the main keywords here. But auxiliaries such as air conditioning and lighting systems are also increasingly the focus of energy efficiency.

The most innovative technologies currently revolve around autonomous driving. Even though some prerequisites still have yet to be established, driverless operation will become a matter of course for more than just underground rail. ■



Eckhard Schulz
Graduate economist (CEO)
Association business manager of the
Interdisziplinärer Forschungsverbund
Bahntechnik e.V.

Companies in the rail industry are increasingly subject to international competition, putting them under ever greater cost pressure. Technical requirements for manufacturers are becoming more and more demanding, which can be seen in tenders and approval procedures.

Trends in the rail industry have shown that the subjects of safety, vehicle availability and digitalisation are playing an increasingly important role. In the future, there will be great demand for technological innovations which reduce life cycle costs. Lastly, data transmission between vehicles and the infrastructure will become more important. At the same time, fire protection is a TOP topic for rail operators, who take the safety of their passengers very seriously. Fire protection has proven to be an essential condition for railway vehicles and railway structures alike, which will pose a serious problem if not fulfilled. Manufacturers of components or systems who fail to fully meet fire protection-related regulations can no longer count on getting orders. ■



Manuel Bosch

Deputy publishing director of the DVV Media Group in charge of publications in the railway and local transportation industry

Competitiveness is the top topic in the railway industry: Rising infrastructure costs, pressure from taxes such as the Renewable Energies Act levy, additional requirements and new competitors such as long-distance buses mean that rail companies have to operate within increasingly tight economic constraints.

Expanding the infrastructure is another priority. The tight economic framework and limited infrastructural capacities place a greater priority on improving efficiency. This entails networking between stakeholders and offerings – regarding information, sales as well as ticketing.

New technologies should improve the efficiency of vehicle materials. Hybrid and fuel cell drives, assistance systems for engine drivers and vehicle weight reduction can make operation more efficient. 3D printing enables new approaches in replacement part procurement and maintenance. New technologies are also extremely important in ensuring compliance with the stringent requirements for safety and environmental friendliness. Digitalisation offers many opportunities in communication with customers and for rail companies' internal processes. Personalised information for passengers and shippers can make rail transport more attractive. ■



Michaela Stöckli

General Manager of SWISSRAIL Industry Association

The railway industry is becoming increasingly demanding. And not only for rail operators, but for industry and its suppliers as well.

Tunnels are becoming longer, trains are becoming faster and safety systems continue to approach perfection. They are all stretched to their limits yet have to keep a handle on their costs at the same time. Public transport must become more efficient and cover greater areas, while safety is to be increased and costs reduced at the same time. This is like trying to square a circle!

Fire protection in particular is the focus of interest when it comes to safety. The Technical Specifications for Interoperability are extremely complex in this respect and pose a challenge to the industry. It is essential for companies to concentrate on these niche topics and broadcast their leadership in technology, especially in connection with challenging issues like these. ■

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WAGNER sets standards for fire protection in rail vehicles thanks to its tailored innovative solutions which fully meet all protection objectives of rail operators and system vendors – from fire detection units to fire suppression and extinguishing. For further information, visit www.wagner-rail.com

Trade fair preview and events

Find out about innovative fire protection technologies from WAGNER here

- **EurasiaRail Istanbul**
2–4 March 2017



- **Expo 1520 Moscow**
21–24 June 2017



- **SwissRail Raildays in Basel (muba Messe)**
12–21 May 2017



- **Trako Gdansk**
26–29 September 2017



- **Iran Rail Expo**
15–18 May 2017



- **InnoTrans Berlin**
18–21 September 2018



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