

Railway Technology

Top of Rail Treatment
Wheel Flange Lubrication
Contact Wire De-icing

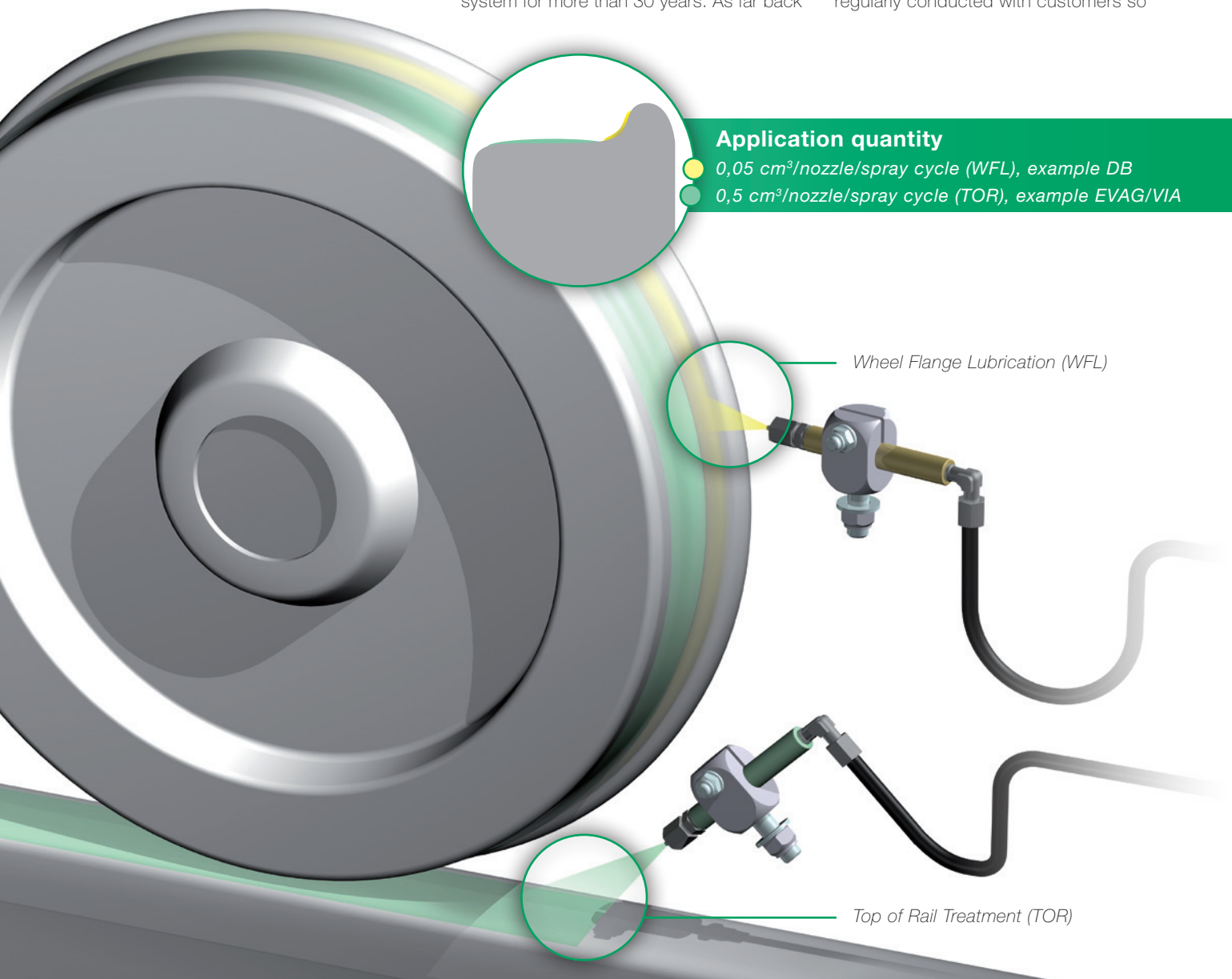
Quietly en route and with reduced wear

Railway noise has a considerable impact on those living nearby. In many towns, complaints about the noise from vehicles which run on rails are increasing. The noise from wheels and rails not only causes annoyance among passengers and residents living nearby, it is also a sign of excessive friction.

The associated wear and increase in energy consumption drive up costs for rail vehicle operators to unacceptable levels. In addition, many town tram networks are completely disrupted every year by contact wire icing. A great annoyance for rail passengers and a risk to the reputation of rail operators. A frequent consequence of frost is damage to pantographs which results in high costs being incurred. The company REBS Zentralschmiertechnik GmbH has been intensively engaged in the development of wheel flange lubrication (WFL) and top of rail treatment (TOR) systems with the patented TURBOLUB® system for more than 30 years. As far back

as 25 years ago, REBS developed the wheel flange lubrication system based on the 'Mono-tube-system'. Thanks to its worldwide success, the company set the trend for modern wheel flange lubrication systems. In collaboration with its long-standing customers, REBS has expanded its product range with a new generation of a contact wire de-icing system.

REBS is working closely together with various different research and technology centres. Vibration and climate chamber tests, as well as EMC investigations, are regularly conducted with customers so



Application quantity

- 0,05 cm³/nozzle/spray cycle (WFL), example DB
- 0,5 cm³/nozzle/spray cycle (TOR), example EVAG/VIA

Wheel Flange Lubrication (WFL)

Top of Rail Treatment (TOR)

Railway Technology

that a unique quality standard for the systems is ensured. The checking rate of the individual components is 100 %, in order that only the highest quality is delivered to the customer. REBS Zentralschmiertechnik GmbH customers include, among others, Bombardier, Siemens, Alstom, DB AG, SNCF and public transport services of many towns. More than 30,000 REBS wheel flange lubrication systems are in operation around the world. The 250th system is already running in the area of mobile top of rail treatment. In order to provide rail operators with decisive cost-effective benefits, wheel flange lubrication systems and top of rail treatment

systems as well as contact wire de-icing systems must be equipped with the most modern high-precision technology. Only many decades of experience can provide an appropriate basis.

An overview of the challenges:

- Excessive lubricant/de-icing agent can lead to environmental pollution and contamination of the vehicles
- In order that no additional repair costs arise, the system must be as maintenance-free as possible
- Lubricants for wheel flange lubrication systems and top of rail treatment systems must be sprayed very finely in order that they are not flung off through the high centrifugal force
- The lubrication system must be able to work with lubricants with a high content of solids because these are able to absorb a significantly higher level of pressure

Trams

- ▶ Tight curve radii make precise lubrication indispensable
- ▶ Customised solutions for situations where space is very limited
- ▶ A compressor unit can also be supplied by REBS to supply compressed air
- ▶ By applying the lubricant using dual nozzles the rear of the wheel flange can be lubricated at the same time (grooved rail)
- ▶ In service vehicles, and where necessary also in scheduled vehicles, an contact wire de-icing system can be installed to prevent downtime caused by frost

Multiple units/ high-speed trains

- ▶ A centrifugal loss of lubricant due to the speed of the train is prevented because of the minimal amount used and the fineness of the spray
- ▶ A control system with curve sensor is often advisable because tight curves and long straight tracks frequently alternate

WFL, TOR, CWDS



WFL, TOR

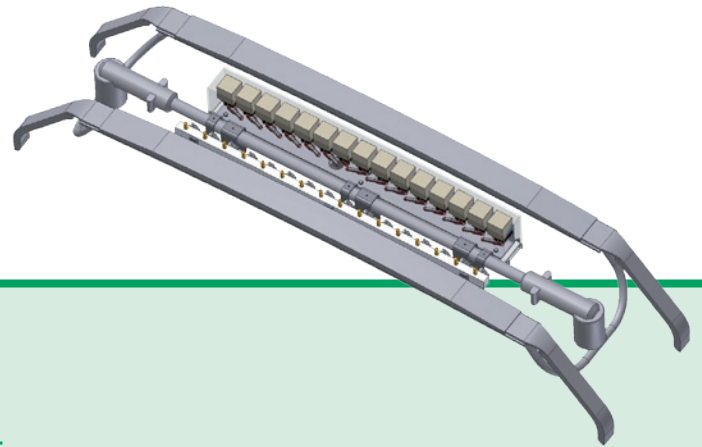


TOR = Top of Rail Treatment
WFL = Wheel Flange Lubrication
CWDS = Contact Wire De-icing System

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WFL, TOR, CWDS



Other challenges facing all systems are extreme temperatures, different requirements for installation, adjustment options, the weight as well as the speeds, all these must be considered.

REBS has been overcoming all of these challenges for decades to the full satisfaction of its customers.

Benefits of the system:

- ▶ Considerable wear reduction
- ▶ Low lubricant/de-icing agent consumption
- ▶ Low-maintenance
- ▶ High efficiency
- ▶ Environmentally friendly thanks to efficiency and precision
- ▶ Quickly pays for itself
- ▶ Increase in customer satisfaction
- ▶ Energy savings through reduction of the rolling resistance
- ▶ No centrifugal loss of lubricant due to the very thin thickness of the layer (WFL/TOR)
- ▶ Significant noise reduction especially when lubricants with a high solids content are used (TOR)
- ▶ Considerable increase of reliability in railway system during the winter (CWDS)
- ▶ Avoidance of tram downtime caused by frost (CWDS)

Locomotives/ works locomotives

Erfurter Verkehrsbetriebe AG –
Reference letter 2011:

Wheel flange lubrication systems incl. compressor unit (WFL)

„The systems have proven themselves not only by the clear reduction in wear at the wheel and rail, but also by their user friendliness. This results in lower maintenance and repair costs in operational services. The quality and durability of the installed system components must also be mentioned. Even during winter the systems work reliably and without complaints.“

We would have no hesitation in recommending REBS wheel flange lubrication systems.“

- ▶ Frequent changes in the direction of travel and tight curve radii make it necessary to lubricate the wheel flanges of several axles
- ▶ Customised solutions for extreme environmental conditions and special applications

WFL, TOR



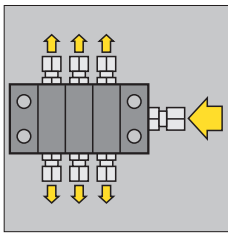
Auxiliary/ special vehicles

- ▶ It is possible to install systems for top of rail treatment in order to treat problem curves
- ▶ Extremely high level of process reliability when mechanically preparing tracks through the use of wheel flange lubrication
- ▶ Because of the partly heavy weight of the vehicles, lubrication is indispensable in order to prevent excessive wear
- ▶ Individual configuration of the lubrication system depending on the task of the vehicle

WFL, TOR

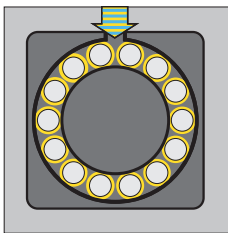


The core business of REBS Zentralschmiertechnik GmbH



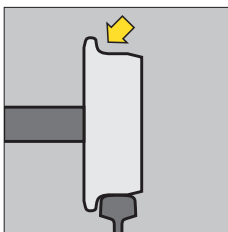
Central Lubricating Systems

- Progressive Distributor
- Dual-line Distributor
- Special Distributor



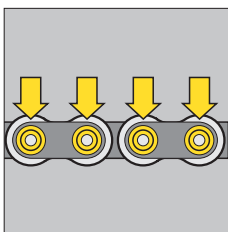
TURBOLUB® Oil/Air Lubrication

- Compact Systems
- SAT System with and without return line
- Special Systems



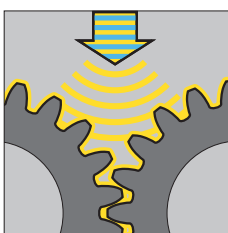
Railway Technology

- Wheel Flange Lubrication
- Top of Rail Treatment
- Overhead Contact Wire De-icing



Automatic Chain Lubrication

- Squirt Lubrication
- Spray Lubrication
- Contact Lubrication



Special Lubrication

- With semi-fluid Grease
- With Grease up to consistency class 2
- With Lubricants containing solid matter

In addition, we also offer a variety of customer-specific solutions.

The company

REBS has been winning over customers for more than 60 years through its experience and uncompromising product quality. The company continuously develops individual solutions for its customers.

With the market and the needs of customers always at the forefront, REBS Zentralschmiertechnik GmbH and its subsidiaries REBS TURBOLUB GmbH and REBS Lubrication Technology Ltd., Shanghai are consistently expanding. Companies worldwide ranging from small enterprises to corporate organisations including those from the steel, automotive, rail and chemical industries trust the expertise of REBS. REBS Zentralschmiertechnik GmbH was founded in 1948 by Alexander Aristides Rebs, the inventor of the progressive distributor (1936). Today, the family business has more than 130

employees and is the leading provider of central lubrication systems in many sectors.

The innovative power of REBS is reflected in the constant stream of new patents which it acquires. Customer support, reliability and the high quality of the systems, which are developed and manufactured in Ratingen (Germany), are a guarantee that customers will receive the maximum added value.

Certification: DIN EN ISO 9001,
DIN EN 15085-2

Further information on the following themes is available upon request:

- ▶ Top of Rail Treatment (TOR)
- ▶ Wheel Flange Lubrication (WFL)
- ▶ Contact Wire De-icing (CWDS)
- ▶ Gear Lubrication
- ▶ Quality Management Rail Technology