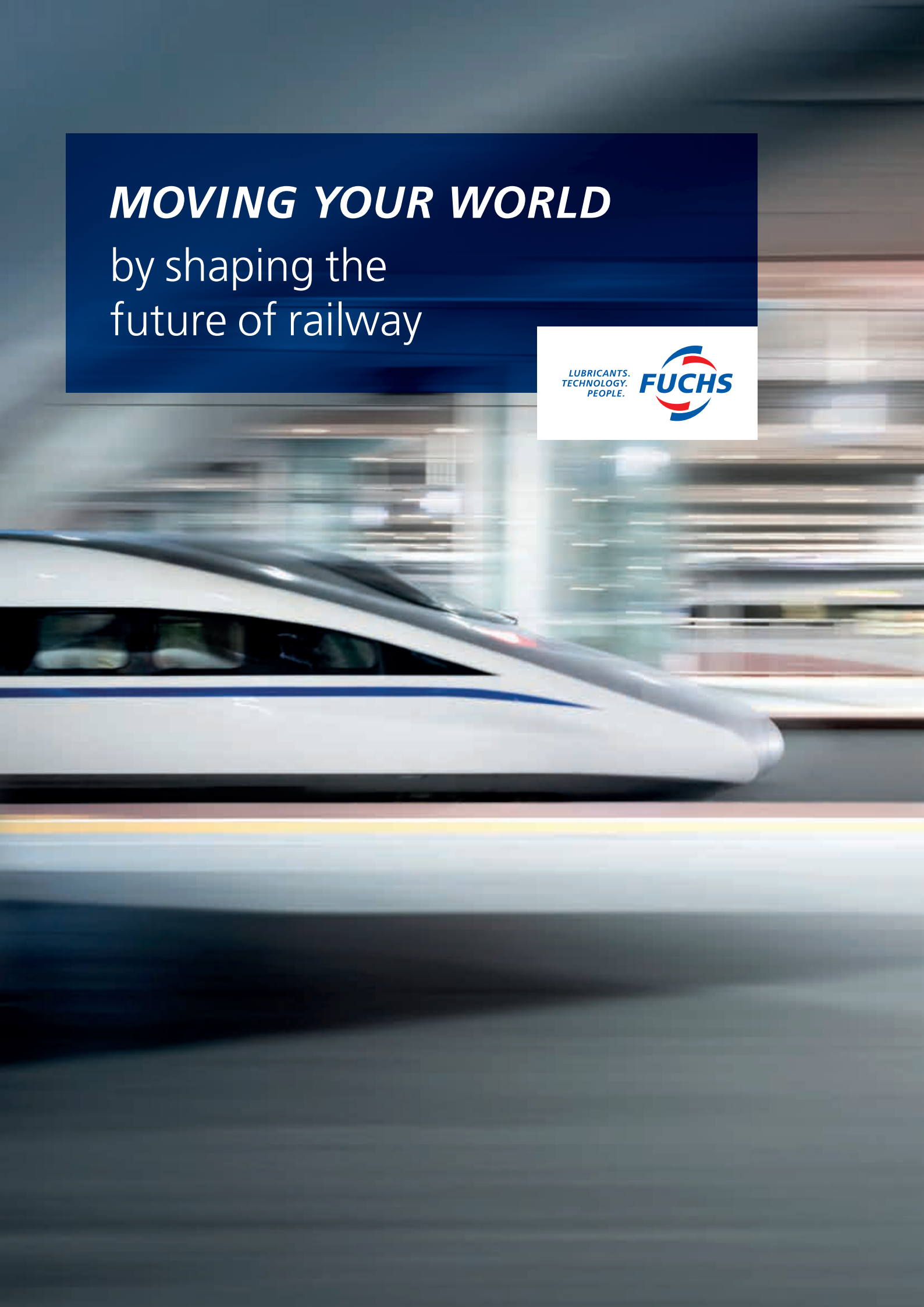

MOVING YOUR WORLD
by shaping the
future of railway
LUBRICANTS.
TECHNOLOGY.
PEOPLE.
FUCHS



FUCHS LUBRICANTS GERMANY

We don't just develop lubricants. For highly complex challenges in a wide range of industries, we develop innovative lubricant solutions that enable the mobility of tomorrow. Our goal: to keep our customers' world in motion. Efficient, sustainable, reliable. Today and tomorrow.

What can we move for you?



FUCHS LUBRICANTS GERMANY

Facts and figures

Company: FUCHS LUBRICANTS GERMANY GmbH, a company of the FUCHS Group
Locations: Mannheim, Kaiserslautern, Kiel and Wedel; approx. 1,400 employees
Product range: A full range of more than 3,000 products for all application areas
Certifications i. a.: ISO 9001, IATF 16949, ISO 14001, ISO 45001, ISO 50001, ISO 21469, HALAL, KOSHER (detailed certifications at www.fuchs.com/de/en)

FUCHS LUBRICANTS GERMANY is a subsidiary of FUCHS SE, the world's largest independent supplier of lubricant solutions. Around 1,400 specialists at all sites work with dedication on innovative lubricant solutions that enable the mobility of tomorrow.

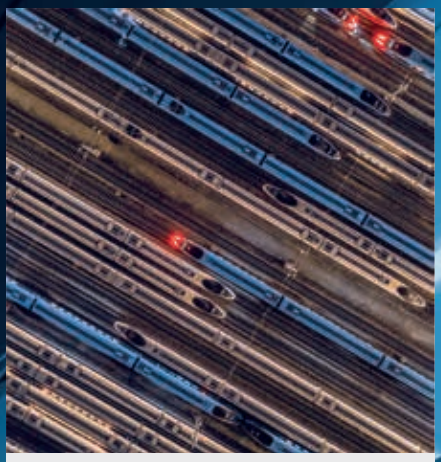
The high level of technical consulting expertise combined with the largest, nationwide network of its own technical contacts makes FUCHS LUBRICANTS GERMANY a reliable local partner. A comprehensive product range, supplemented by digital offerings and Smart Services, as well as many years of lubricant expertise and a high level of research competence are the foundations for the innovative FUCHS lubricant solutions. They reduce wear and energy requirements, extend the running times and service life of machines, and thus keep the world moving - from industrial motors and e-cars to wind turbines and washing machines. FUCHS LUBRICANTS GERMANY is certified to a wide range of standards and, as a technology leader and development partner, places the highest demands on quality management.

Customers in all fields of application and key industries benefit from this commitment to quality. FUCHS makes a significant contribution to promoting sustainability with its climate neutrality strategy. Not only are lubricants manufactured using CO_2-compensated production, but the entire value chain is also considered from a sustainability perspective and is being gradually transformed with a view to a circular economy. FUCHS is also involved in research projects on sustainable raw materials and is working with suppliers and associations to develop certification standards.

MOVING YOUR WORLD

FUCHS sets standards in railway

In the Railway segment, we work closely with manufacturers, operators and maintenance providers. Our solutions are developed where real operational requirements meet technical implementation. Because in railway, one thing matters above all: reliable performance in day-to-day operations.



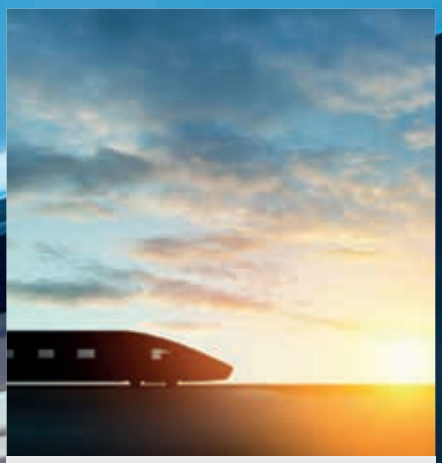
Reliable from rolling stock to infrastructure

Whatever the future brings, safety and reliability will always be at the core of the railway industry. For us, they are a paradigm of the way we work. This is reflected by the performance of every product in our comprehensive portfolio. It covers virtually every application in every type of train, as well as the infrastructure they run on. We understand the complexities and evolving demands placed on railway components; both individually and as part of an integrated system. That is why we collaborate with all actors in the value chain: tier-one suppliers, OEMs, operators, and maintenance service providers. The result is a continuously updated and comprehensive portfolio you can rely on to keep your rolling stock moving.



Hands-on engineering from the lab to the field

Temperature fluctuations, water ingress, electrical loads, de-icing agents, material interactions – railway applications operate under extreme and highly specific conditions. This is why we combine deep application knowledge and lubricant expertise. Together, they enable us to develop tailor-made solutions that maximize sustainable efficiency and long-term performance. As your partner, we are with you every step of the way – from the lab to the field. Backed by extensive engineering capabilities, we consider not just the application, but also its real-world operating and environmental conditions. For example, this may include checking material compatibility and ecological impact criteria. All to achieve longer maintenance cycles, reduce total cost of ownership, and ensure reliable operations.



Ready for what's next

The global railway industry is undergoing fundamental change. Sustainability requirements, rising passenger volumes, and accelerating digitalization are reshaping technologies, standards, and operational expectations. In this evolving environment, our extensive R&D capabilities keep you ready for what's next. They enable us to meet the most advanced standards and provide solutions for the next leap in technology. Working with partners across the industry, we keep up with the latest technology trends and translate them into practical solutions. In all this, our goal is clear: to support your transformation – no matter if it's biodegradable lubricants or regulatory compliance.

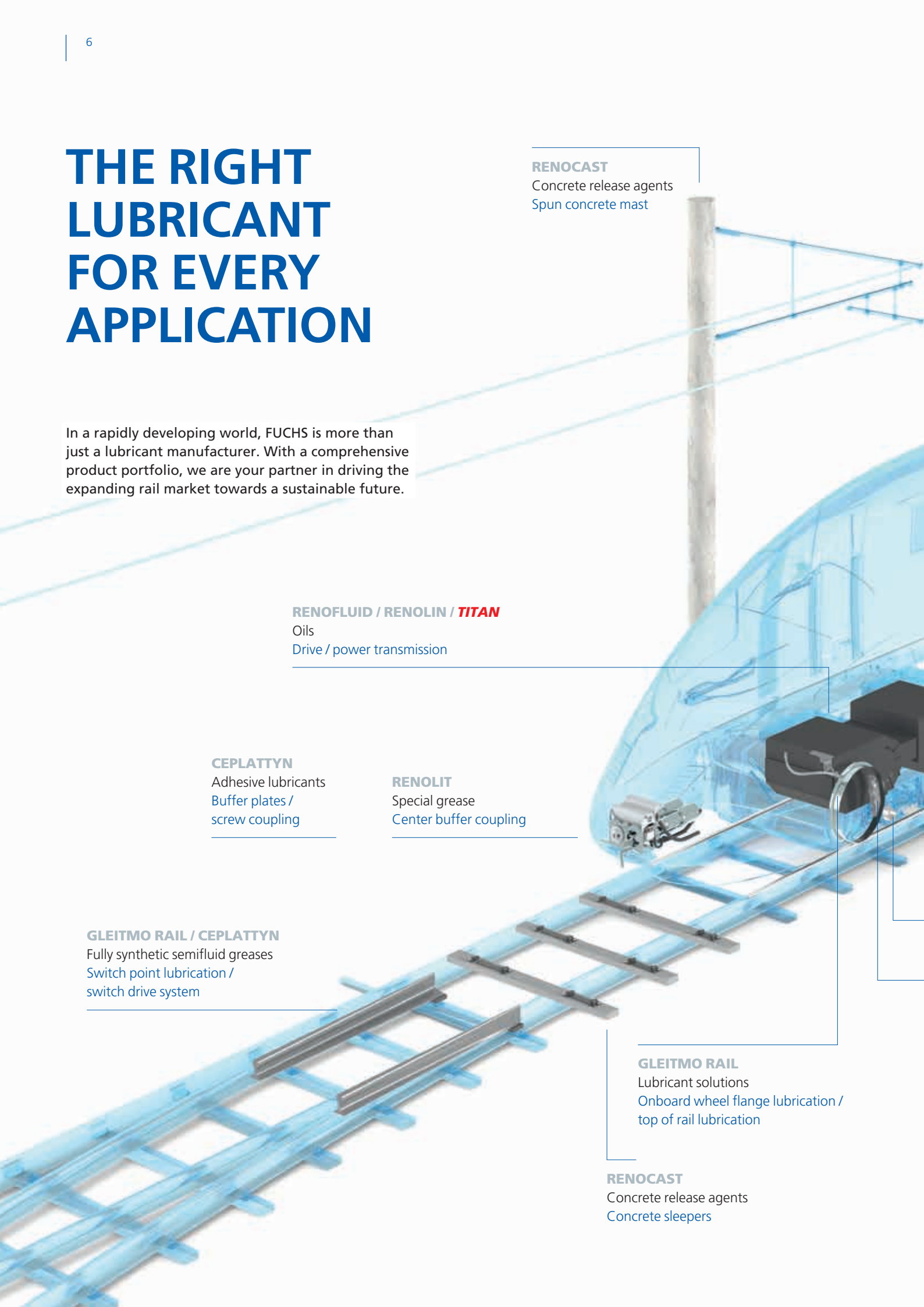


Your partner on every track

Railways need to keep rolling safely and efficiently, no matter what. The key to achieving that goal is understanding the real conditions on the ground. This is why proximity is a key factor in our approach, both in terms of expertise and on-site presence. With a global network of local companies, we are always close and ready to support you – from technical support to reliable local-to-local deliveries. As your partner, we look, learn, explain, and develop solutions together all over the world. Count on us to be with you on every track.

THE RIGHT LUBRICANT FOR EVERY APPLICATION

In a rapidly developing world, FUCHS is more than just a lubricant manufacturer. With a comprehensive product portfolio, we are your partner in driving the expanding rail market towards a sustainable future.



RENOCAST
Concrete release agents
Spun concrete mast

RENOFLUID / RENOLIN / *TITAN*
Oils
Drive / power transmission

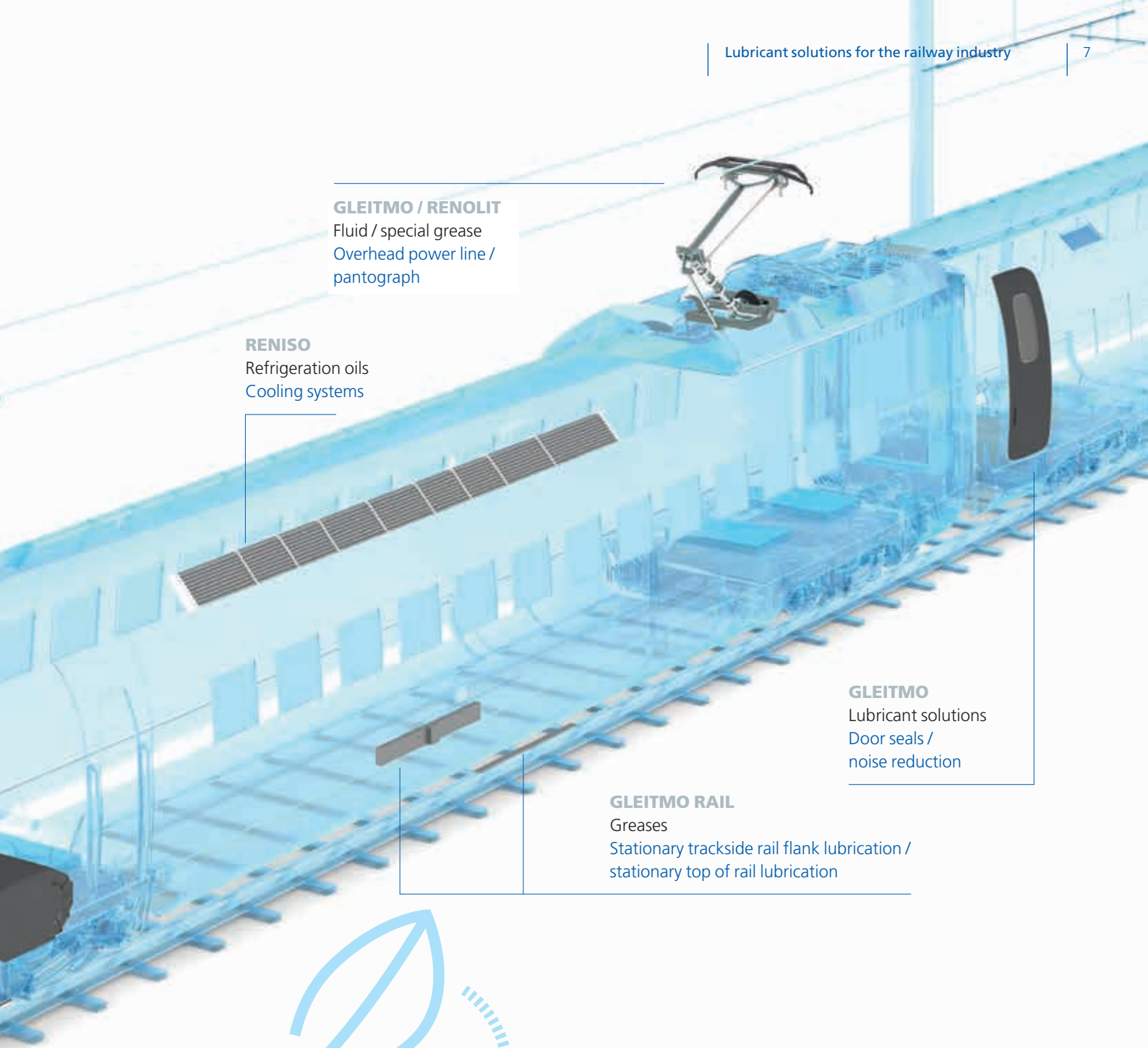
CEPLATTYN
Adhesive lubricants
Buffer plates / screw coupling

RENOLIT
Special grease
Center buffer coupling

GLEITMO RAIL / CEPLATTYN
Fully synthetic semifluid greases
Switch point lubrication / switch drive system

GLEITMO RAIL
Lubricant solutions
Onboard wheel flange lubrication / top of rail lubrication

RENOCAST
Concrete release agents
Concrete sleepers



GLEITMO / RENOLIT
Fluid / special grease
Overhead power line / pantograph

RENISO
Refrigeration oils
Cooling systems

GLEITMO
Lubricant solutions
Door seals / noise reduction

GLEITMO RAIL
Greases
Stationary trackside rail flank lubrication / stationary top of rail lubrication

RENOLIT
Grease
Axle box gear

RENOLIT
Greases
RENOLIN
Hydraulic oil
Air compressor oils
Brake systems

CERTIFIED SUSTAINABILITY

Our products are more than just lubricants. They are drivers of progress, efficiency and sustainability.
With EU Ecolabel certifications and approvals from major players, we stand for quality and innovation.

We develop lubricants that are not only better and more efficient, but also actively engage in sustainable product development. Our lubricants are used not only in Europe, but are also literally on the move in Asia, the Americas and Australia.

FULL SOLUTIONS FOR THE RAILWAY INDUSTRY



SUSTAINABLE | CUSTOMER-FOCUSED

Rising passenger numbers and freight volumes, digitalization, sustainability – the railway industry is on the move. As your development partner, we actively shape your transformation towards greater efficiency and safety. Rely on us to deliver tailormade, complete lubrication solutions, supported by hands-on application engineering and one of the industry's strongest R&D teams.



ALL ABOUT LUBRICATION
WHEEL-RAIL CONTACT



The precise interaction between wheel and rail is crucial for the safe operation of rail vehicles. Our high-quality lubricants play a leading role by ensuring friction-optimized wheel-rail contact. Malfunctions or failures in the lubrication can have a direct impact on driving safety.

Our comprehensive and sustainable product portfolio includes applications for wheel flange lubrication, top of rail friction management and stationary trackside rail flank lubrication.

Our products of the GLEITMO RAIL range offer advantageous versatility: they are not only suitable for the wheel flange and the rail flank, but also for noise reduction on the running surface.



Onboard wheel flange lubrication, top of rail lubrication
GLEITMO RAIL WF Range
GLEITMO RAIL WF-TOR Range
GLEITMO RAIL WF LT
GLEITMO RAIL SK Range
GLEITMO RAIL HLK Range



Stationary trackside rail flank lubrication
GLEITMO RAIL RF-TOR
GLEITMO RAIL RF
GLEITMO RAIL SK-RE 1

Stationary top of rail lubrication
GLEITMO RAIL RF-TOR
GLEITMO RAIL HLK 1

ALL ABOUT LUBRICATION
AXLE BOX GEAR



Lubricating greases for optimum safety and performance in rail transport

Wheelset bearings play a key role in rail vehicles as the interface between the wheelset and the bogie frame.

Their function is very important as they must meet a large number of technical requirements. High safety requirements are placed on both the wheelset and the grease used.



Axle box gear
RENOLIT LX-AB 2

ALL ABOUT LUBRICATION
BRAKE SYSTEMS

In rail vehicle brake systems, our lubricants play a critical role in ensuring the safety and efficiency of vehicle operations and help ensure optimum brake system performance under a wide range of operating conditions.

From high-speed and freight trains to trams, we offer tailor-made solutions to meet the highest demands.

Approvals from leading component manufacturers such as Hanning & Kahl and Knorr-Bremse underline the high quality and performance of our products.



Greases
RENOLIT HLT 2
RENOLIT KBS1

Hydraulic oils
RENOLIN ZAF 32 BHV
Approved by component manufacturers:
- Knorr Bremse I-N000.23 (Rev. 07-19.10.2021),
- Hanning & Kahl GmbH & Co. KG (01.2022)

Compressor oils
RENOLIN 500 Range



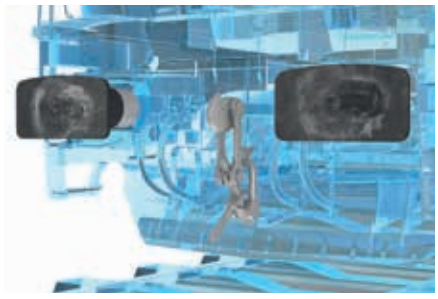
ALL ABOUT LUBRICATION
PUSH AND PULL SYSTEM

The development of train and buffer gear has a long history that is linked to the growth and modernization of rail transport. During operation, the train and buffer gear transmits forces between the coupled vehicles to enable smooth and efficient train operation.

From traditional systems such as buffer plates and screw couplings to today's state-of-the-art automated systems, we offer the right lubricant solutions for all applications.

Our high-quality adhesive lubricants ensure reliable lubrication for buffer plates and screw couplings.





Buffer plates, screw couplings
CEPLATTYN R-VGP



Center buffer couplings
RENOLIT HLT 2

We already have the next generation of lubricants with the EU Ecolabel in our portfolio, which meet the latest environmental standards.

ALL ABOUT LUBRICATION
INTERIOR / EXTERIOR

For the exterior, we offer lubricant solutions that protect and maintain door seals and prevent them from freezing, especially when ice builds up on the exterior.

In the interior, our products prevent squeaking and creaking sounds in the passenger area and thus ensure a pleasant travel experience.



Door seals,
noise reduction
GLEITMO PFG 4022
Approved by Knorr Bremse GmbH
Division IFE Automatic Door System

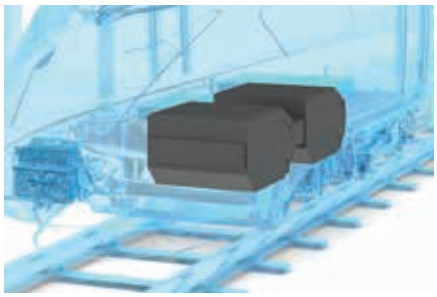
GLEITMO 300
GLEITMO 980



ALL ABOUT LUBRICATION
POWER TRANSMISSION



We also offer a broad portfolio of lubricant solutions for the core application areas of engines, transmissions and cooling systems. Our fluids play a critical role in the functionality, efficiency, and durability of rail vehicles, helping to make them safer, more reliable and more economical to operate.



Drive & power transmission
RENOFLUID
TITAN

ALL ABOUT LUBRICATION
COOLING SYSTEMS



In the field of lubricants and lubrication technology, refrigeration oils occupy a special place.
The long service life expected of refrigeration compressors is closely linked to the high-quality requirements of the lubricants used.

In addition to good miscibility with the refrigerant, good flow properties at low temperatures, high aging resistance and high chemical and thermal stability under the influence of the refrigerant play a key role.

Refrigeration oils
RENISO

ALL ABOUT LUBRICATION
OVERHEAD POWER LINE / PANTOGRAPH



Ice build-up on the overhead power lines can cause significant mechanical and electronic damage, especially if there is no direct contact with the pantograph. This often results in flashovers, which can block the electronics of electrically powered rail vehicles. Such a failure inevitably leads to operational disruptions.

Our GLEITMO RAIL PL fluid excels in the prevention of ice build-ups and is easy to apply.

RENOLIT HLT 2 ensures reliable lubrication of bolts and joints on current collectors. This application guarantees perfect functionality and operational safety under all conditions, especially at extremely low temperatures.



Overhead power line and pantograph
GLEITMO RAIL PL
RENOLIT HLT 2

ALL ABOUT LUBRICATION
INFRASTRUCTURE



Concrete release agents for concrete sleepers and spun concrete mast
For the production of high-quality concrete surfaces, it is mandatory to also use a high-quality concrete release agent. We at FUCHS offer a broad and sustainable product portfolio of concrete release agents for numerous applications such as for the production of concrete sleepers, solid tracks, spun concrete masts and tubbings. Our ester oil-based products RENOCAST RA 3107, RENOCAST RA 3911 and RENOCAST RA 5001 AQUA offer several versatile applications. In addition, our mineral oil-free RENOCAST RA 3210 is used in the production of concrete sleepers where the direct demolding process is applied.



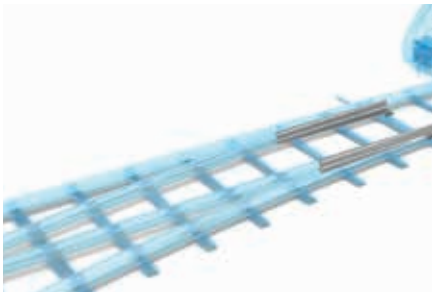
Concrete release agents
RENOCAST Range

ALL ABOUT LUBRICATION
SWITCH POINT LUBRICATION



Switches are one of the most important elements of rail-borne transport. That´s because they enable a change from one track to another and thereby provide the innately rigid rail system with the necessary flexibility and versatility. At the same time, switches are among the structural parts of a railroad that are subject to the most exacting and sensitive demands. If they didn´t function reliably a smooth-running train service would hardly be possible.

The challenge is to make switches work effectively and reliably in all weather conditions. A key factor is the switch lubricant with long-term effect, good adhesive strength and corrosion protection. This not only ensures easy and predictable setting regardless of the ambient temperature, but also allows for long-term re-lubrication, even where frequency of use is low.



Switch point lubrication / switch drive system
GLEITMO RAIL SP
CEPLATTYN R-VGP

ALL ABOUT LUBRICATION **MAINTENANCE**

Effective maintenance
Even when lubricants are used optimally, regular maintenance and repair are essential. The maintenance and repair of vehicles, machines and systems are diverse fields of activity demanding considerable attention and flexibility.

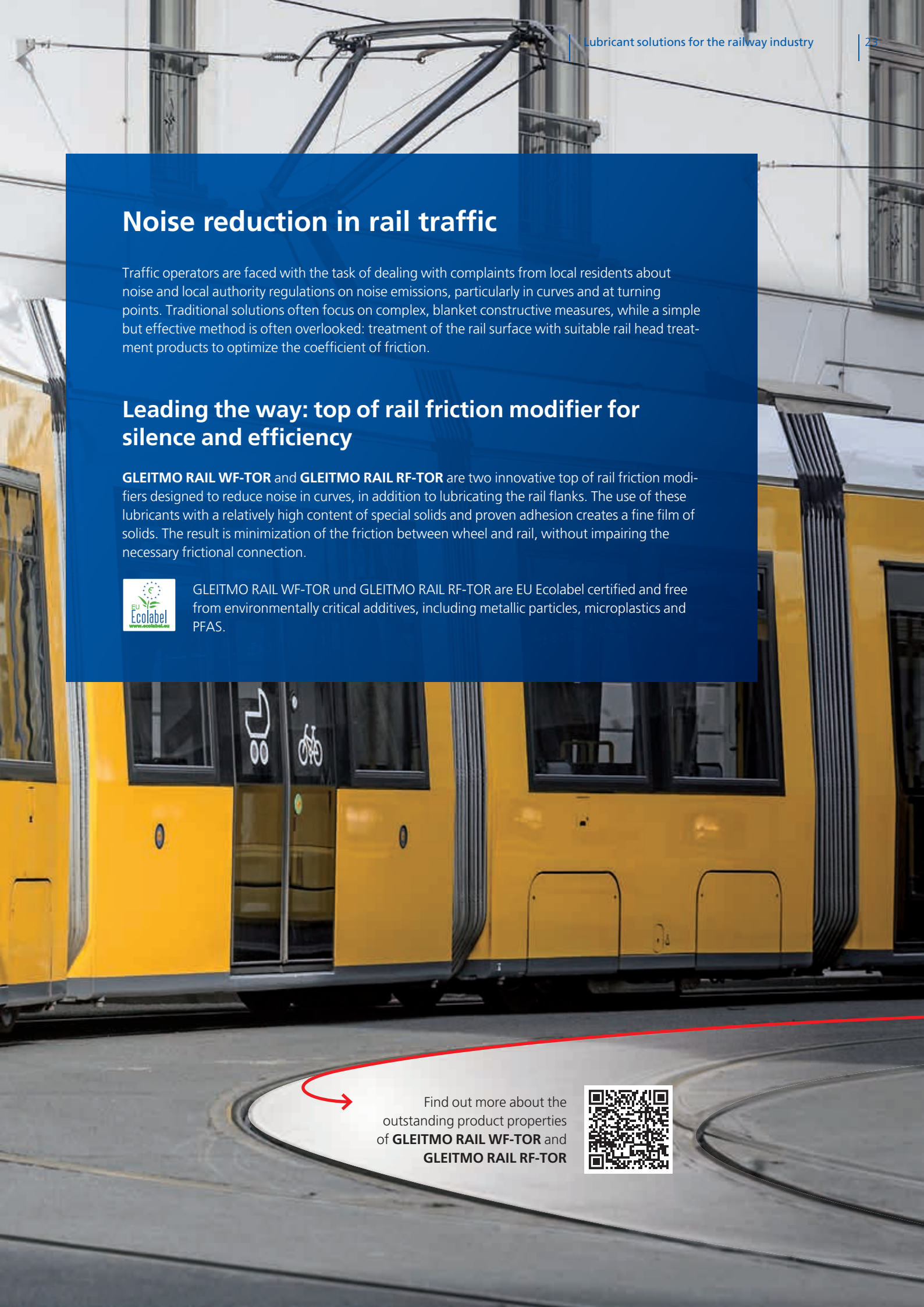
At FUCHS, we understand the importance of a comprehensive approach to care and maintenance and offer a full range of workshop requirements. These range from **special cleaners** and **high-quality assembly pastes** to **products for general care and repair**.





QUIET PLEASE!





Noise reduction in rail traffic

Traffic operators are faced with the task of dealing with complaints from local residents about noise and local authority regulations on noise emissions, particularly in curves and at turning points. Traditional solutions often focus on complex, blanket constructive measures, while a simple but effective method is often overlooked: treatment of the rail surface with suitable rail head treatment products to optimize the coefficient of friction.

Leading the way: top of rail friction modifier for silence and efficiency

GLEITMO RAIL WF-TOR and **GLEITMO RAIL RF-TOR** are two innovative top of rail friction modifiers designed to reduce noise in curves, in addition to lubricating the rail flanks. The use of these lubricants with a relatively high content of special solids and proven adhesion creates a fine film of solids. The result is minimization of the friction between wheel and rail, without impairing the necessary frictional connection.

GLEITMO RAIL WF-TOR und GLEITMO RAIL RF-TOR are EU Ecolabel certified and free from environmentally critical additives, including metallic particles, microplastics and PFAS.

Find out more about the outstanding product properties of **GLEITMO RAIL WF-TOR** and **GLEITMO RAIL RF-TOR**



Axle box bearings in railway – driving safety and efficiency

Axle box bearings form the central interface between the rotating wheelset and the load-bearing bogie frame of a railway vehicle. They must reliably absorb enormous loads – from the weight of an entire railcar to impact forces during switch crossings, curves or shunting operations. High speeds are also among the demanding operating conditions in railway.

Our solution: RENOLIT LX-AB 2
On the test rig, the axle box bearing grease was successfully tested at speeds of up to 220 km/h, demonstrating stable, smooth running behaviour as well as performance reserves for additional requirements.



RENOLIT LX-AB 2 – Developed for the highest demands

RENOLIT LX AB 2 has been specifically developed for use in axle box bearings of regional and high-speed trains.

Key benefits:

- **Longer maintenance intervals:**
  Reduced maintenance effort and lower life-cycle costs.
- **Highest operational safety:**
  Minimises the risk of hot bearings or bearing failures.
- **Reliable performance under all conditions:**
  Thermally stable in heat, cold and wet environments.
- **Compliance with railway standards DIN EN 12081 and DIN EN 12082**



RENOLIT LX AB 2 ensures that your axle box bearings operate with maximum reliability and efficiency in daily service.

→ Learn more:
Technical infomration & FAQs

Ice-free and smooth rail traffic – GLEITMO RAIL PL

Ice build-up on overhead power lines can have serious consequences for the operation of rail vehicles. GLEITMO RAIL PL is the latest product from our research and development department. The fluid lowers the freezing point and effectively prevents the formation of ice on overhead power lines.

In contrast to glycerine-based products, GLEITMO RAIL PL offers optimal adhesion and wetting of the overhead power line due to its pseudo-plastic flow behavior.
GLEITMO RAIL PL can be applied easily with a contact system or manually, without the need for additional personnel or a service vehicle.



→ Further information about GLEITMO RAIL PL

GLEITMO RAIL PL prevents ice build-up and flashovers



Environmentally friendly lubricants for tomorrow´s railroads

Sustainability is at the forefront of our rail lubricant development work. Through the strategic use of our products, we not only help reduce friction, noise and wear, but also minimize the impact on water, air and soil.



GLEITMO RAIL WF-TOR

GLEITMO RAIL WF-TOR sets new standards in the field of loss lubricants.
Not only is it readily biodegradable according to OECD 301 B, it is also free of PFAS (per- and polyfluorinated alkyl compounds) and heavy metals. In addition, it has been awarded the EU Ecolabel, which is an important tool for government agencies and auditors in the verification of the use of environmentally friendly products.

This unique combination of performance and environmental friendliness has also convinced the responsible water authority in the capital region, and GLEITMO RAIL WF-TOR has been approved for use in rail transport. **GLEITMO RAIL WF-TOR is the first product with this approval on the German rail transport market**.

This underlines our pioneering role in the development of environmentally friendly lubricants. In addition, GLEITMO RAIL WF-TOR has a 10% improved carbon footprint* compared to our previous product, making it an even more sustainable choice for rail transport.

As an expert in the railway industry, we not only provide high quality lubricants and advanced solutions, but are also actively committed to a sustainable future.
With our comprehensive product portfolio and our commitment to sustainability, we are your reliable partner for efficient and sustainable rail mobility – now and in the future.

Further EU Ecolabel registered products:

- GLEITMO RAIL RF-TOR
- CEPLATTYN R-VGP
- GLEITMO RAIL SP

* Carbon footprint (CO_2e) savings are based on the current FUCHS methodology for partial PCF calculation (cradle-to-gate, based on ISO 14067:2018) and at the time of publication. You can find more information at fuchs.com/de/en

THE RIGHT LUBRICANT
FOR EVERY APPLICATION

Product		Type of lubricant	Application area
GLEITMO RAIL WF-TOR **GLEITMO RAIL WF** **GLEITMO RAIL WF LT** **GLEITMO RAIL WF 100** **GLEITMO RAIL WF 200** **GLEITMO RAIL SK-RE** **GLEITMO RAIL SK-RE EP** **GLEITMO RAIL SK-RE LT** **GLEITMO RAIL HLK**	(further LOCOLUB ECO PLUS) (further LOCOLUB ECO) (further LOCOLUB NSB) (further TRAMLUB F 234 Mod 1) (further TRAMLUB F 234 Mod 2) (further SINTONO TERRA SK-RE) (further SINTONO TERRA SK-RE EP) (further SINTONO TERRA SK-RE LT) (further SINTONO TERRA HLK)	Semifluid grease	Onboard wheel flange lubrication, top of rail lubrication
GLEITMO RAIL RF-TOR **GLEITMO RAIL RF** **GLEITMO RAIL SK-RE 1** **GLEITMO RAIL HLK 1**	(further GLEITMO RFL ECO) (further TRAMLUB SSM ECO) (further SINTONO TERRA SK-RE 1) (further SINTONO TERRA HLK 1)	Semifluid grease	Stationary trackside rail flank lubrication, top of rail lubrication
RENOLIT LX-AB 2		Special grease	Axle box gear
RENOLIT HLT 2 **RENOLIT KBS1**		Synthetic longlife greases	Brake system
RENOLIN ZAF 32 BHV		Zinc- and ash-free hydraulic oil	Hydraulic brake system
RENOLIN 500er Range		Mineral oil-based VDL air compressor oils	Air compressor
CEPLATTYN R-VGP		Adhesive lubricants	Buffer plates, screw coupling, manual brake spindles, sliding surface lubrication
RENOLIT HLT 2	(further STABYL LT 50)	Special grease	Center buffer coupling, bolts and joints on pantographs
GLEITMO PFG 4022		Special grease	Door seals, noise reduction
GLEITMO 300		Lubricant with clean lubricating film	Door seals, noise reduction
GLEITMO 980		PTFE solid film lubricant	Door seals, noise reduction
RENOFLUID Range **RENOLIN Range** **TITAN Range**		Power transmission oils	Drives, gearboxes
RENISO Range		Refrigeration oils	Cooling system, air conditioning compressors
GLEITMO RAIL PL		Fluid	Overhead power line and pantograph
RENOCAST Range	(further SOK Range)	Concrete release agents	Concrete sleepers, slab tracks, spun concrete masts, tubbings
GLEITMO RAIL SP **CEPLATTYN R-VGP**	(further TRAMLUB 384 G / TRAMLUB 384 G PLUS)	Fully synthetic semifluid greases	Switch point lubrication Switch drive system

MAINTENANCE PRODUCTS

Product	Type of lubricant	Application area
RENOCLEAN Range	Cleaner	Multipurpose application in maintenance
GLEITMO Range	Assembly pastes	Connecting component, bolts, slideways
ANTICORIT Range	Corrosion preventives	Multipurpose application in maintenance
NYE Range	Connector lubricants	Electrical connectors

Notes

Note
The information contained in this brochure is based on the experience and know-how of FUCHS LUBRICANTS GERMANY GmbH in the development and manufacture of lubricants and represents the current state-of-the-art. The performance of our products can be influenced by a series of factors, especially the specific use, the method of application, the operational environment, component pre-treatment, possible external contamination, etc. For this reason, universally-valid statements about the function of our products are not possible.

Our products must not be used in aircraft or spacecraft. Our products may be used in the manufacture of components for aircraft or spacecraft if they are removed without residue from the components prior to assembly into the aircraft or spacecraft.

The information given in this broschure represents general, non-binding guidelines. No warranty expressed or implied is given concerning the properties of the product or its suitability for any given application. We therefore recommend that you consult a FUCHS LUBRICANTS GERMANY GmbH application engineer to discuss application conditions and the performance criteria of the products before the product is used. It is the responsibility of the user to test the functional suitability of the product and to use it with the corresponding care. Our products undergo continuous improvement. We therefore retain the right to change our product program, the products and their manufacturing processes as well as all details of our product information sheets at any time and without prior notification, unless otherwise provided for customer-specific agreements. With the publication of this brochure, all previous editions cease to be valid. Any form of reproduction requires express prior written permission from FUCHS LUBRICANTS GERMANY GmbH.

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FUCHS Lubricants

Innovative lubricants need experienced application engineers

Every lubricant change should be preceded by expert consultation on the application in question. Only then can the best lubricant system be selected. Experienced FUCHS engineers will be happy to advise on products for the application in question and also on our full range of lubricants.

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