FUCHS High-Tech Lubricants

Innovation and expertise

Lubricants for railways
OUR LUBRICANTS KEEP THE WORLD MOVING

For more than 80 years, we have been concentrating all our activities and research efforts on the development of innovative lubricants. This specialization means that we are enjoying continuous growth – geographically, technically and in the number of application areas.

Today, FUCHS is a German company that offers powerful lubricants and related specialties worldwide in practically all areas of application and industries.

What makes our products more valuable.

We develop lubricants on an application-specific basis and tailored to our partners’ processes. Together, we look for the best lubricant for our customers. This type of collaboration is unique in its form, scope and intensity. We call it a development partnership. This ability is based on one key feature: As a German company with its headquarters in Mannheim, we are the largest independent lubricant specialist, and this independence makes all the difference. We are open to new methods and visionary approaches – a prerequisite for innovations. And innovations are a FUCHS trademark.

Together, we can move more.
FUCHS lubricants for railways

Greases for optimum safety and performance in the rail transport sector.

Whether passenger or freight carriage, high speed or heavy freight trains: the technical challenges that modern rail vehicles face are vast. Longer and longer routes, often accompanied by extreme temperature fluctuations, and extended maintenance intervals truly test the smooth interaction of highly stressed mechanical components in the rail transport sector.

FUCHS offers a wide range of grease solutions, which also serve for rationalization of grease types. Highly specialized universal greases guarantee the highest quality standards and availability for high speed and heavy freight trains in one single product.

However, we also develop application-specific, tailor-made greases in close cooperation with our customers which are perfectly matched to the respective requirements.

Thanks to our many years of application experience in the field of rail vehicles, FUCHS offers a large number of greases with proven track records for deployment even under the harshest conditions. Our greases are subject to regular checks and monitoring. In addition to this, every single batch of grease for sensitive applications such as axleboxes or brake systems is checked individually in our ultra-modern laboratory to ensure that it meets the key requirements.

Our RENOLIT series offers you a balanced, full range of greases for high-speed trains, locomotives, as well as passenger and freight trains to ensure optimum technical and economic solutions.

The key here is to ensure absolute reliability of all safety-relevant components such as axleboxes, cardan shafts or brakes.

However, safety and reliability are not the only issues, as emphasis must also be placed on the economic efficiency of the means of transport deployed.

With their innovative wear and corrosion protection, as well as their mechanical resistance, the latest high-tech greases play a key part, even under the harshest of conditions.
Axleboxes

As the interface between wheelsets and bogie frames, axlebox bearings have an extremely important function and must meet a large number of technical requirements in rail vehicles. Indeed, extremely strict safety requirements are placed on both the axlebox and the grease used, which is rated accordingly as „Quality Testing Class I“.

The axlebox consists of bearing housing, roller bearing, sealing and grease. The grease is an important design element that performs a critical task here. Depending on the type of wheelset, cylindrical roller bearings, tapered roller bearings or even spherical roller bearings are used. In this variance, the bearing is subject to high radial forces and therefore generally has special internal polyamide cages fitted for axlebox applications.

Due to the growing trend of using high speed and heavy freight trains for ever longer routes in the rail transport sector, modern axleboxes must offer a longer service life while handling ever greater loads and stresses in terms of weight and temperature.

Highly specialized axlebox greases have an influence on both safety and profitability. RENOLIT greases from FUCHS fulfill the quality standards as per EN 12081. This has been confirmed by an external testing laboratory.

The latest development is to use a single grease for all types of axleboxes and rail vehicles up to a speed of 300 kph (186 mph). FUCHS is setting new standards in this regard with its semi-synthetic grease RENOLIT UNIRAIL 2.

Grease requirement profile testing for railway applications.

All greases from FUCHS are comprehensively and thoroughly tested in our research laboratory and following their introduction they are also subject to a defined 100% batch inspection. In addition to this, the suitability of the greases for railway applications is confirmed by an external laboratory. Before an axlebox grease can be approved and released, the basic properties of the grease must first be tested for compliance with EN 12081. Here, the mechanical stability, the corrosion and wear-protection properties, the oil separation and the low temperature properties are all tested.

The mechanical stability of the grease is evaluated based on the shear resistance after 100,000 double strokes (Pw 100,000) and the grease leakage due to continuous shocks and vibrations in the form of strikes on the axlebox while the grease leakage is measured (V2F test).

The corrosion protection properties are tested with distilled water using the Emcor test. The corrosive attack on the outer bearing ring in contact with water is evaluated after approximately 7 days.

A static oil separation for bearing supply and low temperature properties down to at least -20°C are also defined. The low temperature suitability is assessed with regard to the stiffer consistency at correspondingly low temperatures.

Like all construction elements of an axlebox, the greases are tested under extreme conditions for their specific fields of deployment on a complex test rig employing extreme conditions as per EN 12082. In addition to this an extensive field test with the new grease is performed in line with EN 12082 in corresponding axlebox bearings.

FUCHS is certified to the highest quality standards of ISO 9001:2008 and ISO/TS 16949:2009 and has established itself as a reliable partner, particularly to the automotive and railway industries, over many decades.
FUCHS lubricants for railways

The portfolio of greases from the specialists.

**Pantographs**
- **RENOLIT HI-TEMP 100**
- **RENOLIT WTF 2**
  - Fully synthetic special greases for lubricating bearings of pantographs.

**Door guides / runners**
- **RENOLIT WTF range**
  - Fully synthetic low temperature greases for lubricating gear motors with low power consumption, door guides and door runners.

**Door drive spindle**
- **RENOLIT S 2**
- **RENOLIT HI-SPEED 2**
  - Fully synthetic low temperature greases for lubricating bearings at high speeds, e.g. door drive spindles.

**Train coupling**
- **RENOLIT CA-LZ**
  - Highly adhesive, water-resistant, calcium soap-based long-term lubricating grease for train couplings and used as sealing grease.

**Buffer head**
- **RENOLIT CX-HT 2**
  - Heavy-duty grease with excellent wear and corrosion protection properties for lubricating highly stressed roller and plain bearings, buffer heads, screws and pins.
- **PLANTOGEL 2 F5**
  - Quickly biodegradable heavy-duty grease with excellent wear and corrosion protection for lubricating highly stressed roller and plain bearings, buffer heads, screws and pins.

**Axleboxes**
- **RENOLIT UNIRAIL 2**
  - Semi-synthetic universal axlebox grease for long-term lubrication of high-speed trains, locomotives, passenger and freight trains that travel at speeds of up to 300 kph (186 mph).
- **RENOLIT RS 2**
  - Semi-synthetic lithium soap-based axlebox grease for lubricating wheelsets with tapered roller bearings on rail vehicles that travel at speeds of up to 250 kph (155 mph).
  - Approvals: Gewes, Deutsche Bahn, Voith, MAN, Siemens, ZF, Daimler, Schaeffler
  - **RENOLIT LX-PEP range**
  - Special lithium complex-based grease for long-term lubrication of cardan shafts in rail vehicles. Also for lubricating traction motors and wheel bearings of buses.
  - Approvals: Flender, EP X1
  - **RENOLIT LX-PEP 2**
    - DB material number 873499
  - **RENOLIT POLAR BLACK**
    - Fully synthetic low temperature grease with good corrosion protection properties and solid lubricants for lubricating highly stressed bearings and for slewing rings.

**Cardan shaft**
- **RENOLIT LX-PEP 2**
  - Semi-synthetic lithium soap-based axlebox grease for lubricating wheelsets with tapered roller bearings on rail vehicles that travel at speeds of up to 250 kph (155 mph).
  - Approvals: Gewes, Deutsche Bahn, Voith, MAN, Siemens, ZF, Daimler, Schaeffler

**Curved tooth coupling**
- **RENOLIT SO-GFB**
  - Mineral oil-based sodium semi-fluid grease for lubricating curved tooth couplings and sealed transmissions.
  - Approvals: Flender

**Slewing ring**
- **RENOLIT POLAR BLACK**
  - Fully synthetic low temperature grease with good corrosion protection properties and solid lubricants for lubricating highly stressed bearings and for slewing rings.

**Brake system**
- **RENOLIT HLT 1**
  - Fully synthetic lithium soap-based special greases for lifetime lubrication of pneumatic brake systems.
  - Approvals: Deutsche Bahn, Knorr Bremse, Wabco
  - **RENOLIT KBS 1**
  - Fully synthetic lithium soap-based special greases for lifetime lubrication of pneumatic brake systems.
  - Approvals: Deutsche Bahn, Knorr Bremse, Wabco

**Approvals:**
- DB material number 873499
- DIN EN 12081
- DIN EN 12081 RADSATZROLLENLAGERFETT
- DIN EN 12081 (for RENOLIT RS 2)
- DB material number 106225
- DB material number 106212

**Other Approvals:**
- Gewes
- Deutsche Bahn
- Voith
- MAN
- Siemens
- ZF
- Daimler
- Schaeffler

**Additional Greases:**
- **RADSATZROLLENLAGERFETT**
  - Mineral oil-based grease on a lithium soap basis for lubricating axleboxes on passenger and freight trains that travel at speeds of up to 200 kph (125 mph).
  - Approvals: DIN EN 12081
  - DB material number 106225
RENOLIT UNIRAIL 2

RENOLIT UNIRAIL 2 is a semi-synthetic grease free of group 1 base oils and based on a lithium soap. RENOLIT UNIRAIL 2 contains additives for improved EP capacity, wear, corrosion and oxidation protection and a reduced coefficient of friction. RENOLIT UNIRAIL 2 is water-resistant and has a high degree of mechanical stability. The operating temperature range stretches from –30°C to +140°C.

RENOLIT UNIRAIL 2 was developed as a universal grease for general lubrication of all kinds of axleboxes of rail vehicles that travel at speeds of up to 300 kph (186 mph). As a universal axlebox grease, it is suitable for use in high-speed trains, locomotives, passenger and freight trains.

RENOLIT RS 2

RENOLIT RS 2 is a semi-synthetic grease, based on a lithium soap and an oxidation stable base oil mixture that is free of group 1 base oils.

RENOLIT RS 2 offers particularly good shear stability, water resistance and corrosion protection, even to salt water. A highly effective combination of additives guarantees secure lubrication of rolling and plain bearings. The operating temperature range stretches from –30°C to +120°C.

RENOLIT RS 2 was developed for long-term lubrication of axleboxes with tapered roller bearings for speeds of up to 250 kph (155 mph).

Approval: EN 12081

Specifications
- Operating temperature: –30°C to +120°C
- Dropping point: ≥ 180°C
- NLGI grade: 2
- PW60 [0.1 mm]: 265 – 295
- Base oil viscosity at 40°C: 8.6 mm²/s
- Base oil viscosity at 100°C: 11.5 mm²/s
- Classification: KP 2 N-40
- Colour: Light brown

Specifications
- Operating temperature: –30°C to +120°C
- Dropping point: ≥ 180°C
- NLGI grade: 2
- PW60 [0.1 mm]: 265 – 295
- Base oil viscosity at 40°C: 83 mm²/s
- Base oil viscosity at 100°C: 11.5 mm²/s
- Classification: KP 2 K-30
- Colour: Brown

RENOLIT LX-PEP 2

RENOLIT LX-PEP 2 is a lithium complex soap-based EP multi-purpose grease with a broad temperature range. It offers a good load-carrying capacity, outstanding corrosion protection properties, even under unfavourable environmental influences (humidity, aggressive atmosphere and water) and a high degree of thermal resistance.

RENOLIT LX-PEP 2 is particularly well suited to lubricating cardan shafts in rail vehicles, and can also be used for lubricating the electric motor bearings of traction motors and wheel bearings of buses.

Approval: Cardan shaft grease with DB material number 873499 (previously 106 223), ZF, MAN, Daimler, SAF, Voith, Schaeffler, John Deere

Specifications
- Operating temperature: –30°C to +150°C
- Dropping point: ≥ 250°C
- NLGI grade: 2
- PW60 [0.1 mm]: 265 – 295
- Base oil viscosity at 40°C: 170 mm²/s
- Base oil viscosity at 100°C: 14 mm²/s
- Classification: KP 2 N-30
- Colour: Green

Specifications
- Operating temperature: –50°C to +140°C
- Dropping point: ≥ 180°C
- NLGI grade: 1
- PW60 [0.1 mm]: 310 – 340
- Base oil viscosity at 40°C: 84 mm²/s
- Base oil viscosity at 100°C: 11.7 mm²/s
- Classification: KPHC 1 N-50
- Colour: Light brown

FUCHS lubricants for railways

Product highlights

While the information and figures given here are typical of current production and conform to specification, minor variations may occur. Subject to amendments. Data as at: 08/2012

Specifications
- Operating temperature: –30°C to +140°C
- Dropping point: ≥ 180°C
- NLGI grade: 2
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- Colour: Light brown

Specifications
- Operating temperature: –30°C to +120°C
- Dropping point: ≥ 180°C
- NLGI grade: 2
- PW60 [0.1 mm]: 265 – 295
- Base oil viscosity at 40°C: 83 mm²/s
- Base oil viscosity at 100°C: 11.5 mm²/s
- Classification: KP 2 N-40
- Colour: Light brown

Specifications
- Operating temperature: –30°C to +150°C
- Dropping point: ≥ 250°C
- NLGI grade: 2
- PW60 [0.1 mm]: 265 – 295
- Base oil viscosity at 40°C: 170 mm²/s
- Base oil viscosity at 100°C: 14 mm²/s
- Classification: KP 2 N-30
- Colour: Green

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FUCHS lubricants for railways

The portfolio of oils from the specialists.

Engines
- TITAN CARGO MAXX SAE 10W-40
- TITAN CARGO LA SAE 10W-40
- TITAN RAILGEN 13 SAE 20W-40
- TITAN RAILGEN 13 SAE 40 (primarily intended for US design locomotives)

Compressed air supply
- RENOLIN UNISYN OL range
- RENOLIN COOL +
- RENOLIN VDL range

Turbo coupling
- RENOFUID TF 1500

Transmissions
- TITAN CYTRAC RR SAE 75W-90
- TITAN CYTRAC MAN SYNTH SAE 75W-80
- TITAN GEAR LS SAE 90
- TITAN ATF 5005

Shock absorbers
- TITAN SAF shock absorber oils

For use in control gears
- RENOLIN UNISYN, PG, HighGear

For hydraulic travel drives
- RENOLIN XtremeTemp, B HVI, PLANTOHYD, PLANTOSYN

For passenger compartment A/C systems
- RENISO SE 55, RENISO SE 170
FUCHS lubricants for railways

**Product highlights**

**RENOLIN CH**
High-grade cylinder oils, some of which have synthetic components for lubricating steam cylinders for maximum steam temperatures of up to around 380°C.

**RENOLIN UNISYN OL**
**RENOLIN COOL** *
Fully or semi-synthetic compressor oils for heavy-duty compressors for the generation of compressed air; extended maintenance intervals possible.

**RENOLIN UNISYN CLP**
**RENOLIN PG**
**RENOLIN HighGear SYNTH**
Synthetic gear oils for lubricating heavy-duty helical, planetary, bevel or worm gears. Reduction of friction, temperature and wear.

**RENOLIN Xtreme Temp**
**RENOLIN B HVI**
Special hydraulic oils for use in varying ambient temperatures; highly aging-resistant, reduced energy consumption, increased efficiency. Extension of changing intervals possible.

**RENISO TRITON SE 55**
**RENISO TRITON SE 170**
Fully synthetic polyolester-based refrigerator oils – ideally suited to „non ozone-damaging“ CFC/HFC refrigerants. For lubricating air conditioning compressors.

**RENOFLUID TF 1500**
Mineral transmission oil for drives with hydrodynamic transducers or turbo couplings. Excellent aging and temperature resistance. Approved by VOITH TURBO for railway applications and other fluid couplings.

**PLANTOGEAR S**
Quickly biodegradable synthetic gear oil for transmission lubrication in environmentally-sensitive areas.

**PLANTOHYD**
**PLANTOSYN**
Fully synthetic, quickly biodegradable hydraulic oils; highly aging-resistant; for use in environmentally-sensitive areas.

**TITAN CARGO MAXX SAE 10W-40**
Premium MAXX Performance engine oil with new XTL® technology. Offers very good cold start properties and excellent aging resistance for additional fuel savings over the entire oil change interval. Qualified for railway applications in line with: ACEA E9/E7/E6, API CI-4, CATERPILLAR CAT ECF-1-a, MTU 3.1/1800, DB approval

**TITAN CARGO LA SAE 10W-40**
Fuel-saving ultra high performance engine oil. Qualified for railway applications in line with: ACEA E6/E7, API CI-4, MTU 3.1/1800

**TITAN RAILGEN 13 SAE 20W-40**
**TITAN RAILGEN 13 SAE 40**
Zinc-free and chlorine-free high performance diesel engine oil that has been specially developed to fulfil the requirements of diesel engines (also 2-stroke diesels) in rail vehicles. Specially developed for US design diesel engines, which use friction bearings containing silver (optimum compatibility thanks to zinc-free and chlorine-free additive technology). Qualified for railway applications in line with: API CF/CD, GE Gen. 4L, GM-EMD Gen. 5, LMOA Gen. 5, CATERPILLAR 3600

**TITAN CYTRAC RR SAE 75W-90**

**TITAN CYTRAC MAN SYNTH SAE 75W-80**
Premium performance gear oil for extended oil change intervals in automated ZF multi-speed transmissions (AS Rail), on the basis of fully synthetic base oils. Allows fuel savings through optimum transmission efficiency. Suitable for the longest oil change intervals and compatible with carbon synchronizers. Qualified for railway applications in line with: API GL-4, ZF 16K

**TITAN GEAR LS SAE 90**
High performance gear oil with LS (limited slip) additive for axle drives in rail vehicles with and without multi-disc LS-differentials. Qualified for railway applications in line with: API GL-5, ZF 16E

**TITAN ATF 5005**
Premium performance ATF for ZF Ecomat automatic transmissions. Excellent base oil quality for best low-temperature performance and high aging stability. Long-term stabilized friction properties for excellent clutch performance throughout the entire changing interval. Qualified for railway applications in line with: DEXRON IIIH, ZF 16L
FUCHS high-tech 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.

Note

The information contained in this product information is based on the experience and know-how of FUCHS EUROPE SCHMIERSTOFFE GMBH in the development and manufacturing 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 pretreatment, possible external contamination, etc. For this reason, universally valid statements about the function of our products are not possible. The information given in this product information 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 EUROPE SCHMIERSTOFFE 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 are subject to continuous further development. 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 warning. With the publication of this product information, all previous editions cease to be valid.

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