



Special lubricants for the railway and other environmentally sensitive areas



**BECHEM**  
LUBRICATION  
TECHNOLOGY





# Special lubricants for rail applications

BECHEM – Lubrication solutions for industry












As the oldest German manufacturer of industrial lubricants, BECHEM is one of the leading producers of high-quality special lubricants and metalworking fluids today.

BECHEM products stand out through innovative formulations in the most diverse industrial applications – in machining and forming for metalworking processes, in coating technology and as for-life lubricants in various technical components.



















A strong network of distributors and several national and international production sites ensure that BECHEM products are readily available worldwide.

**Tomorrow's technologies. Today.**

## APPLICATIONS

- Switches 
- Rails 
- Wheel flanges 
- Buffer plate 
- Roller bearings 
- Plain bearings 
- Chains 
- Thread lubrication 
- Electrical contacts 
- Closed gears 
- Hydraulic 

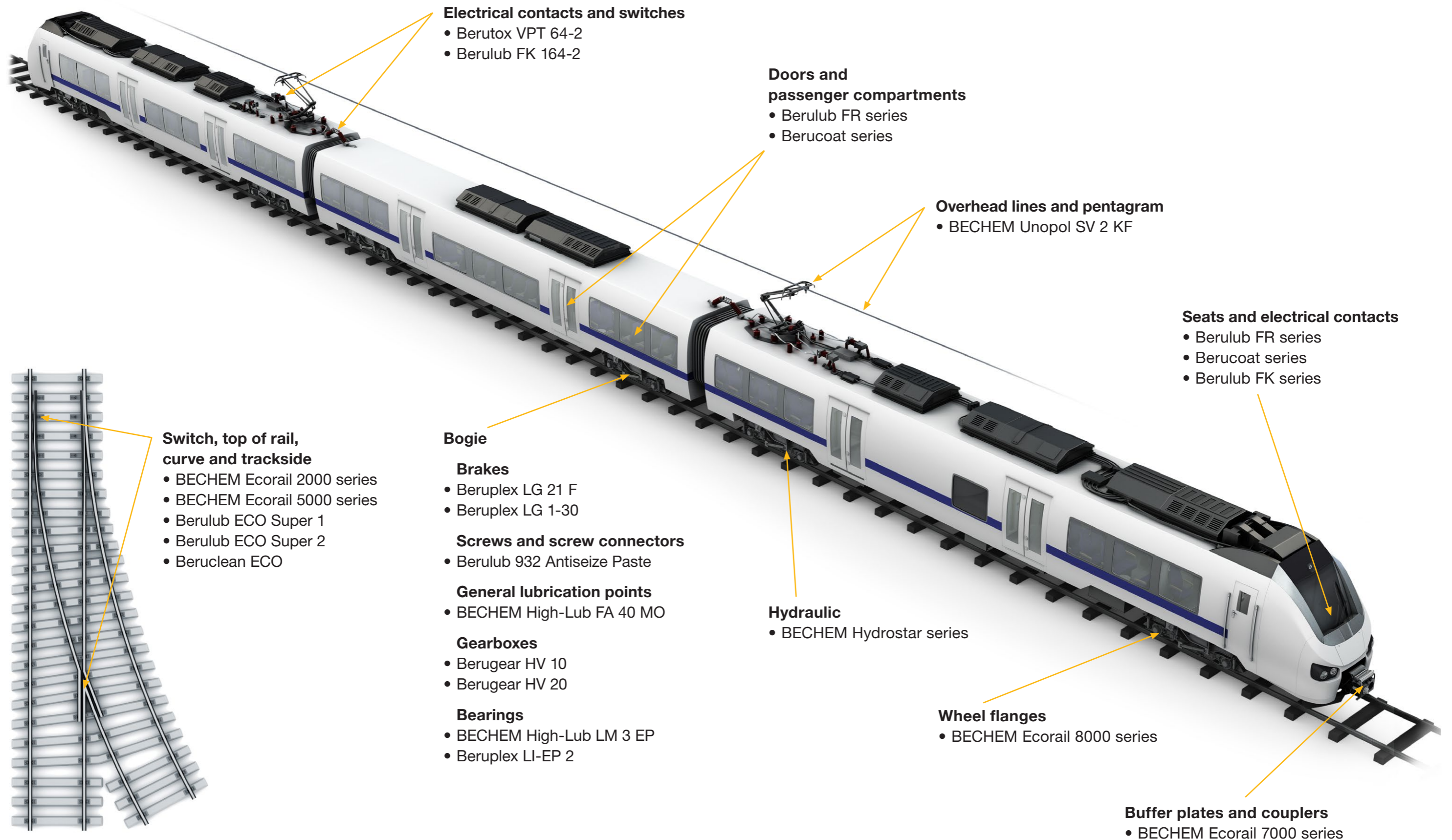
## PROPERTIES

- High temperatures 
- Low temperatures 
- High loads 
- High speed 
- Resistant to water 
- Noise damping 
- Good pumpability 
- Good rinsing performance 
- Low foaming 
- Cleaning agent 
- Food grade/ Pharmaceutical technology 
- UV tracer 
- Compatible with plastics 
- Corrosion protection 
- Biodegradable 
- Available in cartridges 
- Available in aerosols 
- Product in aerosols 

All indications and values correspond to latest knowledge and do not represent any product specification



# Special lubricants for rail applications



**Electrical contacts and switches**

- Berutox VPT 64-2
- Berulub FK 164-2

**Doors and passenger compartments**

- Berulub FR series
- Berucoat series

**Overhead lines and pantograph**

- BECHEM Unopol SV 2 KF

**Seats and electrical contacts**

- Berulub FR series
- Berucoat series
- Berulub FK series

**Switch, top of rail, curve and trackside**

- BECHEM Ecorail 2000 series
- BECHEM Ecorail 5000 series
- Berulub ECO Super 1
- Berulub ECO Super 2
- Beruclean ECO

**Bogie**

**Brakes**

- Beruplex LG 21 F
- Beruplex LG 1-30

**Screws and screw connectors**

- Berulub 932 Antiseize Paste

**General lubrication points**

- BECHEM High-Lub FA 40 MO

**Gearboxes**

- Berugear HV 10
- Berugear HV 20

**Bearings**

- BECHEM High-Lub LM 3 EP
- Beruplex LI-EP 2

**Hydraulic**

- BECHEM Hydrostar series

**Wheel flanges**

- BECHEM Ecorail 8000 series

**Buffer plates and couplers**

- BECHEM Ecorail 7000 series

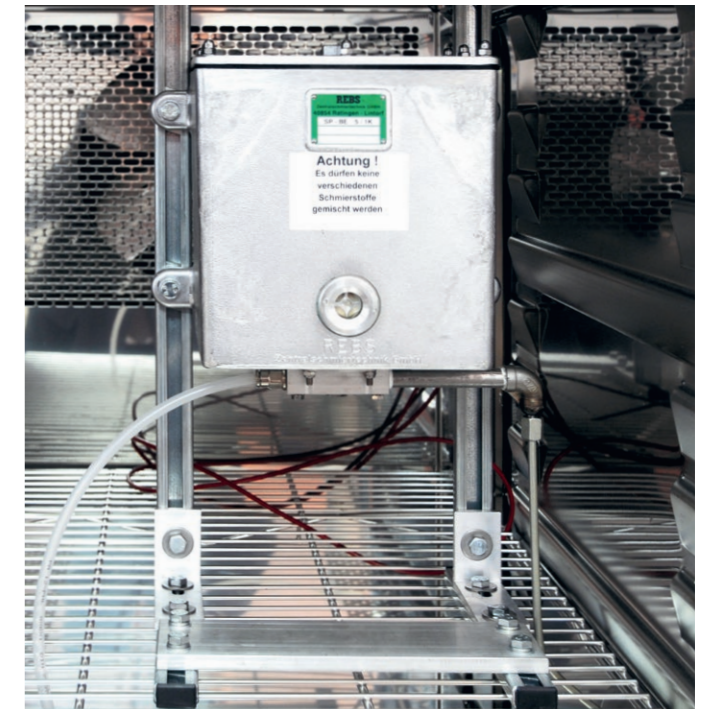


# Chassis and drives

Today, lubricating greases and pastes on chassis and drives are exposed to increasing loads. BECHEM products are field-proven, extremely reliable, thereby providing an absolutely perfect interaction of all components.

In order to meet global lubrication requirements of the railway systems already during the product development process, BECHEM has its own test benches, e.g. for wheel flange lubrication. In combination with climatic chambers in the BECHEM technical centre, we are able to create operating conditions ranging from arctic to subtropical conditions in order to examine and develop lubricants that comply exactly with the requirements of our customers.

» Lubricants are developed in accordance with customer specifications. «



Test bench for wheel flange lubrication



PRODUCT	PRODUCT						Applications	Description
	Base oil	Thickener	NLGI-grade	Kinematic viscosity (mm <sup>2</sup> /s) at 40 °C / 100 °C	Service temperature range (°C)			
Lubricating greases Berplex LG 21 F Berplex LG 1-30 Berugear HV 10 Berugear HV 20 BECHEM High-Lub LM 3 EP Berplex LI-EP 2 BECHEM High-Lub FA 40 MO Berutox M 21 EPK	Polyglycol	Lithium complex soap	1-2	390 66	-40	+145	Clutch systems, brake technology, elastic axle bearings	Synthetic special lubricant for tribological pairings metal/elastomer, EPDM and plastic, temperature-stable/oxidation-stable, good adhesion, good corrosion protection, good EP properties, water-resistant
	Polyglycol	Lithium complex soap	1-2	30 7	-50	+145	Clutch systems, brake technology, elastic axle bearings	For slide pairings metal/elastomer and metal/plastic, wide application temperature range, good adhesion, temperature-resistant, corrosion-resistant, oxidation-resistant, copper corrosion protection, contains PTFE and EP/AW additives
	Mineral oil, synthetic oil	-	-	7000 370	-	-	Gearboxes	High-performance fluid with extremely high base oil viscosity for open and slow-running closed gear units, excellent wear protection, very high load-carrying capacity, excellent adhesion
	Mineral oil, synthetic oil	-	-	18500 550	-	-	Gearboxes	High-performance fluid with extremely high base oil viscosity for open and slow-running closed gear units, excellent wear protection, very high load-carrying capacity, excellent adhesion
	Mineral oil	Lithium soap	3	105 10	-30	+140	Bearings	Long-term lubricating grease, excellent pumpability in central lubrication systems, excellent water resistance, EP-properties, good low-temperature properties, corrosion protection
	Mineral oil	Lithium complex soap	2	180 16	-30	+150	Wheelset bearings, cylindrical and tapered roller bearings, electric motor bearings	Long-term EP grease, excellent corrosion protection and wear, excellent pumpability, even under shock load, protection against high temperatures and moisture
	Mineral oil	Lithium-calcium-soap	2	400 30	-20	+120	Spline connections	For long-term lubrication, good sealing qualities, excellent water resistance and pumpability, excellent corrosion protection, high load-carrying capacity, with solid lubricants and EP-additives
Pastes Berulub 932 Antiseize Paste	Mineral oil	Polyurea	1-2	490 32	-20	+160	Plain and roller bearings, screw connectors, bushes, locks, brakes, linear bearings	Multi-purpose grease for plastic/metal slide pairings, high corrosion and wear protection, good adhesion, resistant to oxidation, water, and steam, water repellent, EP-properties
	Medical white oil	Gel	1*	70 9	-40	+1400	Screw connectors, bushes, locks, linear bearings	Universal screw paste, prevents cold welding and fretting corrosion, metal-free, light-colored solid lubricants, resistant to water, many acids and lyes, H1 registered

\* The indication refers to the unworked penetration



# Connections and maintenance

For the lubrication of connections, such as screw couplings, buffer heads or air compressors, reliable high performance lubricants are indispensable. BECHEM products withstand both the enormous pressure during the shunting operation and the high forces while driving. For these demanding conditions, BECHEM has developed railway lubricants that provide the required safety, but also ensure a comfortable ride.

PRODUCT		Base oil	Thickener	NLGI-grade	Kinematic viscosity (mm <sup>2</sup> /s) at 40 °C/100 °C		Service temperature range (°C)	Applications	Description
Greases	<b>Berulub FG-H 2 SL</b> 🔧 ⚙️ 🛢️ 🛠️	Synthetic hydrocarbon	Special calcium complex soap	2	50 8	-45 +160	+200	Automatic clutch connections	High-performance lubricant, good adhesion and sealing properties, resistant to water and aging, reliable corrosion protection, suitable for central lubrication systems, H1 registered, Halal and Kosher certified, certified according to ISO 21469
	<b>Berulub FG-H 2 EP</b> 🔧 🛢️ ⚙️ 🛠️	Polyalpha-olefin (PAO)	Special calcium complex soap	1-2	150 18,5	-40 +160		Automatic clutch connections	Universal lubricant, high load-carrying properties, good adhesion and sealing effect, reliable corrosion protection and wear, resistant to ageing, water, disinfectants and cleaners, H1 registered, halal and kosher certified, certified according to ISO 21469
Oil	<b>Berulub 46 - 100 H1</b> 🔧 🛢️ ⚙️ 🛠️	Polyalpha-olefin (PAO)	-	-	46 7,9 68 11,0 100 14,5	-40	+120	Hydraulic, gear units, blowers, air compressors, friction gears	High-performance oil for circulation lubrication and for transport chains, effective corrosion and wear protection, neutral to conventional seals and paints, odorless and taste, H1-registered, halal and kosher certified, certified according to ISO 21469
Service products	<b>Beruclean ECO</b> 🧼 🛠️	-	-	-	-	-	-	Cold cleaner	Universal cold cleaner, free of aromatic hydrocarbons, virtually odorless, strong dissolution effect, removes all types of oil and grease contaminations, oil carbon, waxes, tar, bitumen, quickly biodegradable according to OECD 301 F, A7, Approval: SNCF=MTP No 17 0261 du 09/08/2017, H1 registered, Halal and Kosher certified
	<b>Beruclean 3050 ECO</b> 🧼 🛠️	-	-	-	-	-	-	High pressure and steam jet units, manual cleaning	Aqueous intensive and special cleaner for industrial contamination, neutral towards all surfaces, low consumption, low foaming, suitable for steel and iron materials, aluminum, tiles, plastic surfaces, engines, vehicles, machines.

<sup>1)</sup> Value marked in gray indicates short term maximum temperature



» Special lubricants for greater reliability. «



















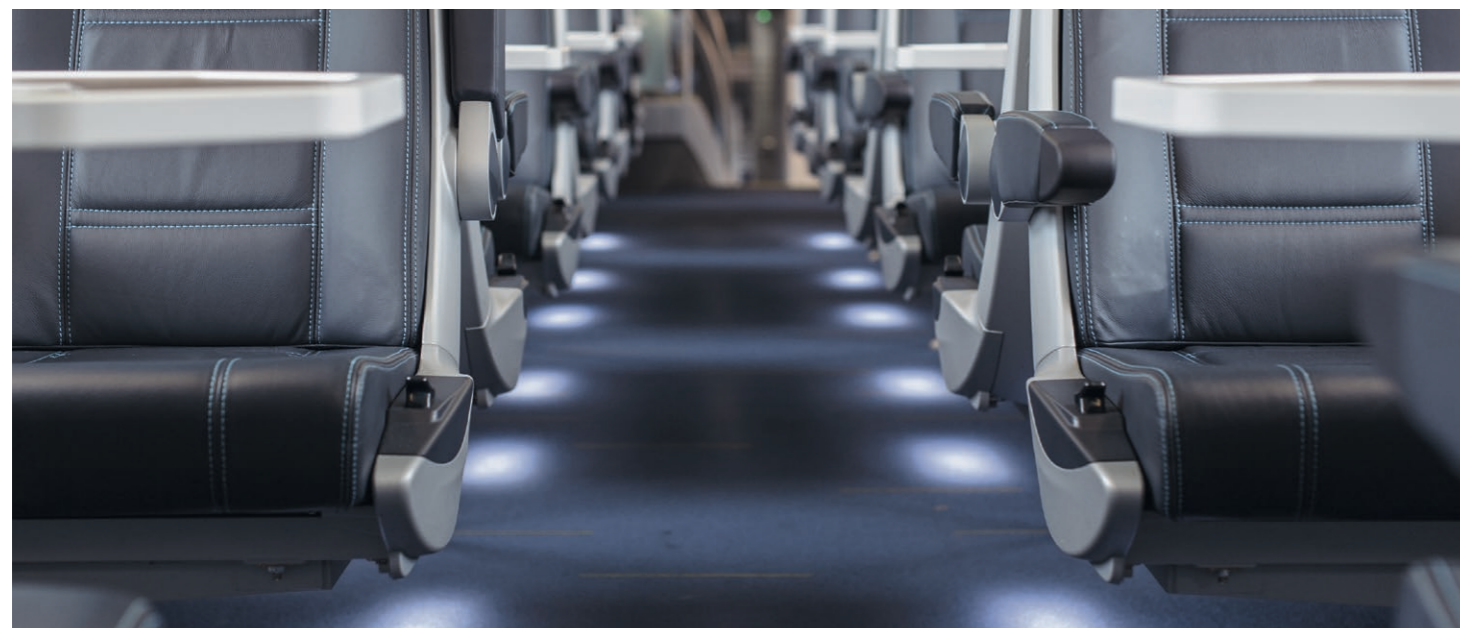
# Vehicle and interior components

Based on their vibration-reducing properties and optimized friction coefficient, BECHEM lubricants allow monitored, reproducible movement processes in all interior components, such as seat and table systems, door panels, actuators and switch systems.

BECHEM products thus make a large contribution to the functionality and the haptics of interior components and sustainably upgrade the respective construction parts and vehicles. Special products, designed for interfering noise reduction, ensure significant improvement of driving comfort.

	PRODUCT							Applications	Description
	Base oil	Thickener	NLGI-grade	Kinematic viscosity (mm <sup>2</sup> /s) at 40 °C / 100 °C	Service temperature range (°C) <sup>1)</sup>				
Lubricating greases	<b>Berutox FB 22</b> 	Polyalpha-olefin (PAO)	Barium complex soap	2	50 8	-40 +180 +200	Door, running surfaces, locking mechanisms, springs, locking slides, torsional springs	For long-term lubrication at high speeds, good consistency-temperature-behavior, excellent water resistance, excellent corrosion and wear protection, good pumpability	
	<b>Berulub KR-EP 2</b> 	Synthetic oil combination	Lithium soap	2	15 4	-50 +120	Door, linear guidance, drive spindles	Low-temperature and high-speed lubricant, low start-up resistance at low temperatures, protects against corrosion and moisture	
	<b>Beruglide L</b> 	Perfluoropolyether (PFPE)	Polytetrafluorethylene (PTFE)	1-2*	160 16	-40 +190	Doors, seals, anti-squeak applications, for currents from 10 mA to 30 A	Fully synthetic special grease for plastic and polymer materials, excellent resistance to oxidation/aggressive media, good noise damping properties, contains PTFE, certified according to ISO 21469	
	<b>Berulub FK 164-2</b> 	Perfluoropolyether (PFPE)	Polytetrafluorethylene (PTFE)	2	150 45	-60 +250	Doors, seals, anti-squeak applications, for currents from 10 mA to 30 A	Lifetime lubricant for plastic and polymer materials, excellent resistance to oxidation/aggressive media, good noise damping properties, contains PTFE, certified according to ISO 21469	
	<b>Berutox VPT 64-2</b> 	Perfluoropolyether (PFPE)	Polytetrafluorethylene (PTFE)	2	330 30	-30 +260	Noise damping, seats, folding tables, adjustment levers, for currents from 10 mA to 30 A	Long-term lubricating grease, even for vacuum, radiation and aggressive chemicals, excellent compatibility with plastics, outstanding thermal stability, odorless, also available in NLGI-grade 1	
Spray	<b>Berulub ND Spray</b> 	Perfluoropolyether (PFPE)	-	160 16	-40 +200	Noise damping, seats, doors, folding tables, seals, garbage cans, back rests	Fully synthetic special spray for noise damping, good plastic and elastomer compatibility, odorless, high thermal and oxidation resistance		
Anti-friction coatings	<b>Berucoat AK 978</b> 	Organic binder	-	-	-	-40 +80	Anti-squeak applications, door modules, covers, arm rest closure	Water based interior AF-coating, prevents stick-slip and disturbing noises, highly compatible with plastics, transparent, free of formaldehyde, with UV-tracer	
	<b>Berucoat FX 876</b> 	Organic binder	-	-	-	-40 +80	Plastics, elastomers, leather, fabric	Long-term elastomer AF-coating, water based, two-component coating, noise damping, reduction of friction, good water resistance, wear resistant	
	<b>Berucoat AK 376</b> 	Organic binder	-	-	-	-40 +120	Plastics, elastomers, leather, fabric	Long-term AF-coating for plastic and/or steel material combinations, no dust adhesion, prevents stick-slip, good corrosion protection	
	<b>Berucoat AF 732</b> 	Organic binder	-	-	-	-70 +250	Locking systems, door openers	Long-term AF-coating for metal/metal material combinations, excellent adhesion, no sticking of dust, prevents stick-slip, excellent corrosion protection, oil resistant	

<sup>1)</sup> The indication refers to the unworked penetration <sup>2)</sup> Value marked in gray indicates short term maximum temperature





# Environmentally compatible lubricants for rail systems

Lubricants for rail-bound transport systems often have direct contact with the environment. The environmentally friendly, readily biodegradable lubricants for the rail system by BECHEM fulfil and even considerably exceed legal requirements, thus ensuring permanently trouble-free and safe operation of the rail networks. The lubricants are optimally adjusted to the various requirements to allow worldwide application, such as low temperature behaviour, sprayability, centrifugal characteristics, and pressure stability. BECHEM railway lubricants are used in such components as wheel flanges, switches or rails.



The voluntary European Environmental Label (EU Eco label) introduced by an EU ordinance is a quality seal for products that are distinguished by a high level of environmental compatibility.

PRODUCT	Lubricants						Applications	Description
	Base oil	Thickener	NLGI-grade	Kinematic viscosity (mm <sup>2</sup> /s) at 40 °C / 100 °C	Service temperature range (°C)			
<b>BECHEM Ecorail 2001 Plus</b> 	Synthetic oil combination	Gel	-	11 3	-30	+80	Switch, wheel flange	Switch lubricant, readily biodegradable according to OECD 301 C, medium adhesion, SNCF approval No. IEM 05 004, excellent sprayability, contains light-colored solid lubricants
<b>BECHEM Ecorail 2009</b> 	Ester	Bentonite	000*	46 9	-30	+80	Switch, wheel flange	Switch lubricant, readily biodegradable according to OECD 301 B, excellent adhesion, contains light-coloured solid lubricants
<b>BECHEM Ecorail 2012</b> 	Synthetic oil combination	Lithium-calcium-soap	000*	20 6	-30	+80	Switch, wheel flange	Switch grease, readily biodegradable according to OECD 301 B, very good adhesion even for highspeed railways, for all climatic conditions, contains solid lubricants
<b>BECHEM Ecorail 2016</b> 	Synthetic oil combination	Lithium-calcium-soap	000*	20 6	-30	+130	Switch, wheel flange	Switch grease, readily biodegradable according to OECD 301 B, very good adhesion even for highspeed railways, for all climatic conditions, contains solid lubricants, approval: SNCF = MTP 17293 du 25/09/2017
<b>BECHEM Ecorail 5501</b> 	Ester	Lithium-calcium-soap	1	110 14	-55	+120	Rail	Lubrication of rail systems, readily biodegradable according to OECD 301 B, contains light-colored solid lubricants and dewatering additives, high absorption of pressure and shock loads, good adhesion, approval: Bijur Delimon (StaTrack)
<b>BECHEM Ecorail 5502</b> 	Ester	Lithium-calcium-soap	2	110 14	-45	+120	Rail, wheel flange	Lubrication of rail systems, readily biodegradable according to OECD 301 B, contains light-colored solid lubricants, high absorption of pressure loads/shock loads, good adhesion
<b>BECHEM Ecorail 8000</b> 	Ester	Lithium-calcium-soap	000*	50 9	-30	+80	Wheel flange	Wheel flange lubricant, sprayable, readily biodegradable according to OECD 301 B, fluid, without solid lubricants, water resistant
<b>BECHEM Ecorail 8200</b> 	Synthetic oil combination	Lithium-calcium-soap	00	35 7,5	-40	+100	Rail, wheel flange	Wheel flange lubrication, readily biodegradable according to OECD 301 B, reliable corrosion, outstanding wear protection, high pressure accommodation capacity, good adhesion, high proportion of light-colored solid lubricants, approvals: Rebs, Bijur Delimon
<b>BECHEM Ecorail 8400</b> 	Ester	Calcium-soap	000	45 10	-40	+100	Rail, wheel flange	Wheel flange lubrication, readily biodegradable according to OECD 301 B, reliable corrosion protection, very good water resistance, high pressure accommodation capacity, very good adhesion, high proportion of light-colored solid lubricants, EEL certificate

\* The indication refers to the unworked penetration

## User-friendly and environmentally compatible

### BECHEM spray systems

Convenient and low-priced application technology is important for the user. The devices developed by BECHEM in collaboration with partner companies, are designed to meet the requirements of the different railway companies, thereby providing good comfort, stability and easy handling. In addition, they are equipped with safety quick-release locks that allow quick separation of the spray lance in case of a dangerous situation.



Spray system for the application of lubricants



# Environmentally-friendly lubrication oils and greases

Whether as a hydraulic fluid, gear or chain saw oil – BECHEM offers a product range for many applications, which makes a significant contribution to the environmentally sound use of lubricating oils. The base oils, partly based on renewable raw materials, are far superior to conventional oils in technical performance as a pioneering generation of semi and fully synthetic biodegradable lubricants.

The non-aging BECHEM products are characterized by a high level of technical lubrication performance, preserve resources and fulfill a number of standards and requirements.

PRODUCT	Base oil		Thickener	NLGI-grade	Kinematic viscosity [mm <sup>2</sup> /s] at 40 °C/100 °C		Service temperature range [°C]	Applications	Description
<b>Lubricating greases</b> Berugar UWS FG 34-00 Berulub ECO Super 1 Berulub ECO Super 2	Ester		Lithium-calcium-soap	00	320 40	-50	+80	Wheel flange, plain and roller bearings	Gear lubricant for open gear drives, readily biodegradable according to OECD 301 C, excellent wear protection, excellent adhesion, very high load-carrying capacity, contains light-coloured solid lubricants
	Ester		Lithium-calcium-soap	1	110 14	-55	+120	Rails, plain and roller bearings	Lubricating grease for roller and plain bearings, reliable corrosion protection, resistant to water, contains solid lubricants, readily biodegradable according to OECD 301 C
	Ester		Lithium-calcium-soap	2	110 14	-45	+120	Rails, plain and roller bearings, hydraulic	Lubricating grease for roller and plain bearings, readily biodegradable according to OECD 301 B, reliable protection against corrosion, resistant to water, contains solid lubricants

PRODUCT	Base oil	Kinematic viscosity [mm <sup>2</sup> /s] at 40 °C/100 °C		Viscosity index		Service temperature range [°C] <sup>1)</sup>	Pourpoint [°C]	Flash point [°C]	Type	Applications	Description
<b>Hydraulic fluids</b> BECHEM Hydrostar HEP 32 BECHEM Hydrostar HEES 46 EEL BECHEM Hydrostar HEP 46 EEL BECHEM Hydrostar TE 68 S	Ester	32 7	193	-25	+90 +120	-27	≥ 260	HEES	Hydraulic	Hydraulic oils based on synthetic ester, complies with ISO 15380, readily biodegradable according to OECD 301 B	
	Ester	46 9	160	-30	+90 +120	-45	≥ 250	HEES	Hydraulic	High-performance synthetic ester based hydraulic oil, readily biodegradable according to OECD 301 B, complies with ISO 15380, VDMA 24568, Swedish Standard SS 15 54 34, EU Ecolabel, other viscosities on request	
	Ester	46 9	170	-30	+90 +120	-42	≥ 270	HEP	Hydraulic	Hydraulic oil based on synthetic ester, readily biodegradable according to OECD 301 B, complies with ISO 15380, VDMA 24568, Swedish Standard SS 15 54 34	
	Ester	68 13	180	-30	+90 +120	-30	≥ 300	HEP HFD-U	Hydraulic	Flame retardant, water-free hydraulic fluid, extended oil service life, quickly biodegradable according to OECD 301 B, meets DIN ISO 15380 and VDMA 24568 requirements	
<b>Various</b> Berulub ECO GD 40 Spray Berulit ECO S 5 Beruclean ECO Beruclean 3050 ECO BECHEM Unopol SV 2 KF	Ester	-	-	-30	+90	-	-	-	-	Rust removers, corrosion protection, cleaning and care agents	Multifunction spray, readily biodegradable acc. to OECD 301 C, acid and resin free, odorless, water repellent, good creeping properties
	Polyglycol/water	-	-	-40	+60	-45	-	-	-	Corrosion protection	Acid and resin free oil to lubricate pneumatic tools, good corrosion protection and wear
	-	-	-	-	-	-	≥ 65	-	-	Cold Cleaner	Universal cold cleaner, free of aromatic hydrocarbons, virtually odorless, strong dissolution effect, good cleaning effect, quickly biodegradable according to OECD 301 F, A7, H1 registered, Halal and Kosher certified, approval: SNCF = MTP 17293 du 25/09/2017
	-	-	-	-	-	-	-	-	-	High pressure and steam jet units, manual cleaning	Aqueous intensive and special cleaner for industrial contamination, neutral towards all surfaces, low consumption, low foaming
	Mineral oil	100 11	-	-30	+150 +200	-	-	-	-	Corrosion protection	Anti-corrosion grease especially for overhead cables, high thermal stability, protects against aggressive media, water repellent, NLGI-grade 0

<sup>1)</sup> Value marked in gray indicates short term maximum temperature



BECHEM hydraulic fluids reduce friction and wear, even at high thermal loads



# Railway Technology

The train's arriving -  
with lubricants made by BECHEM



Information on the compliance with regulations and religious dietary rules to be taken from our sales documentation.

**LUBRICATION SOLUTIONS FOR INDUSTRY**

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