



Environmentally-friendly  
lubricants and additives



# Biodegradable lubricants for environmentally sensitive areas

## BECHEM – Lubrication solutions for industry

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










BECHEM products are proven by innovative formulations in the most diverse of industrial applications – in machining and forming metal working 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.**

## PICTOGRAMS

### APPLICATIONS

- Hydraulic 
- Saw chains 
- Open gears 
- Plain bearings 
- Roller bearings 
- Rails 
- Railway switches 
- Buffer plate 
- Wheel flanges 

### PROPERTIES

- Biodegradable 
- Low foaming 
- Food grade/  
Pharmaceutical technology 
- Low temperatures 
- High temperatures 
- Resistant to water 
- Good pumpability 
- Corrosion protection 



# Expertise in environmentally-friendly lubricants

BECHEM has developed a powerful product range of environmentally-friendly lubricants and additives as a product of extensive research and development work. In addition to quick biological degradability and partly renewable raw materials, the biodegradable lubricants from BECHEM are characterized by a high level of technical lubrication performance.

BECHEM biodegradable lubricants demonstrate a high level of efficiency. This is made clear by prolonged machine running times due to lower wear and extended oil change intervals, depending on the application.

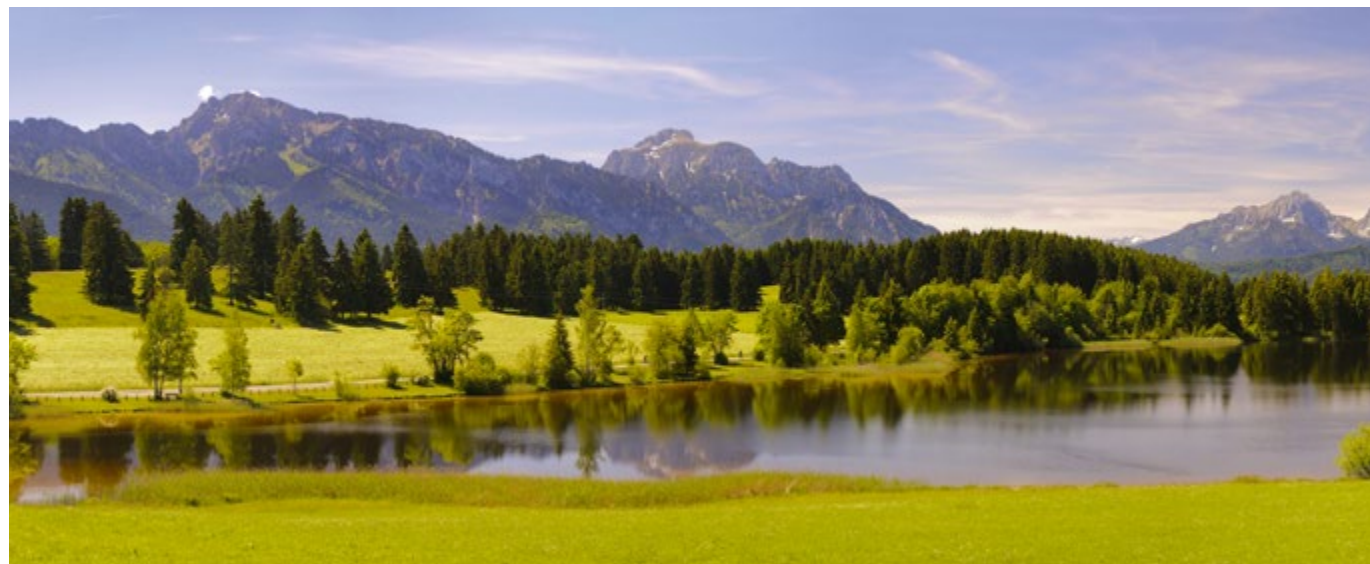
For every requirement, BECHEM offers the right native, semi-synthetic or fully synthetic biodegradable lubricant products.



BECHEM assembly pastes provide for flawless guidance of threads on the drill pipes.



BECHEM chain saw oils meet the highest demands for chain lubrication.



» Biodegradable lubricants make an important contribution to environmental protection. «

# 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.



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.



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

	PRODUCT	Base oil		Thickener		NLGI-grade		Base oil viscosity (mm <sup>2</sup> /s) at 40 °C / 100 °C		Service temperature range [°C] <sup>1)</sup>		Properties
Lubricating greases	<b>Berugear UWS FG 34-00</b> 	Ester		Lithium/calcium soap		00		320 40		-30	+80	Lubricant for open gears, readily biodegradable according to OECD 301 C, excellent wear protection, excellent adhesion, very high load carrying capacity, contains light-coloured solids
	<b>Berulub ECO P-Way Lube</b> 	Ester		Lithium/calcium soap		1		110 14		-30	+120	Green lubricating grease for sliding surfaces and seals, readily biodegradable, reliable protection against corrosion, water resistant, contains light solid lubricants
	<b>Berulub ECO Super 2</b> 	Ester		Lithium/calcium soap		2		110 14		-45	+120	Grease for roller and plain bearings, readily biodegradable according to OECD 301 B, reliable protection against corrosion, water resistant, contains light-coloured solid lubricants, also available in NLGI-grade 1
	<b>Berulub ECO LCE 2</b> 	Ester		Lithium/calcium soap		2		46 9		-30	+120	Multipurpose grease for plain bearings and seals, readily biodegradable, water resistant, shear stable, suitable for central lubrication systems

	PRODUCT	Base oil		Base oil 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	Properties
Hydraulic fluids	<b>BECHEM Hydrostar HEP 22 → 32</b> 	Ester		22 32	6 7	175 193	-20 -25	+90 +90		-24 -27	≥ 250 ≥ 260	HEES	Hydraulic oils based on synthetic ester, readily biodegradable, complies with DIN ISO 15380, VDMA 24568, Swedish Standard SS 15 54 34
	<b>BECHEM Hydrostar HEP 46 EEL → 68 EEL</b> 	Ester		46 68	9 13	170 175	-30 -30	+90 +90		-42 -42	≥ 270 ≥ 270	HEES	Hydraulic oils based on synthetic ester, readily biodegradable, complies with DIN ISO 15380, VDMA 24568, Swedish Standard SS 15 54 34, EU Ecolabel, viscosity 46: biodegradable according to OECD 301 B
	<b>BECHEM Hydrostar HEES 46 EEL</b> 	Ester		46	9	160	-30	+90 +120		-45	≥ 250	HEES	High-performance synthetic ester based hydraulic oil, readily biodegradable according to OECD 301 B, complies with DIN ISO 15380, VDMA 24568, Swedish Standard SS 15 54 34, EU-Ecolabel, other viscosities on request
	<b>BECHEM Hydrostar TE 68 S</b> 	Ester		68	13	180	-30	+90 +120		-30	≥ 300	HFD-U	Fire-resistant hydraulic fluid, readily biodegradable according to OECD 301, complies with VDMA 24568, DIN EN ISO 15029-1 and DIN EN ISO 15380
Various	<b>BECHEM ECO Fluid CS 120</b> 	Native oil		51	10	160	-15	+120		-21	≥ 290	-	Chain saw oil, good adhesion, high ageing resistance, high wear protection, good cold flow properties, fulfils the requirements of the KWF (Kuratorium für Waldarbeit- und Forsttechnik e.V.)
	<b>Berulub ECO GD 40 Spray</b> 	Ester		1,3	-	-	-30	+90		-	-	CLP E	Multifunctional spray, readily biodegradable according to OECD 301 C, acid and resin free, suitable as rust solvent, protection against corrosion, cleaning and maintenance agent, water repellent, good creeping properties
	<b>Berulit ECO S 5</b> 	Polyglycol/Water		10	-	-	-40	+60		-45	-	-	Acid and resin free oil to lubricate pneumatic tools, readily biodegradable, good protection against corrosion and wear
	<b>Beruclean ECO</b> 	-		-	-	-	-	-		-	≥ 65	-	Universal cold cleaning agent, readily biodegradable according to OECD 301 F, removes oil and grease contaminations as well as waxes, resins, bitumen, tar and oil carbon, NSF-H1, Halal and Kosher certified

<sup>1)</sup> Value marked in grey indicates short term maximum temperature.  
All indications and values correspond to latest knowledge and do not represent any product specification.



# Environmentally-friendly rail lubricants

The frequent exposure of rail lubricants with the environment requires the use of environmentally compatible, biologically quickly biodegradable qualities in order to meet existing legal requirements. BECHEM rail lubricants meet these requirements and are optimally suited for the various requirements in global use with respect to temperature behavior, sprayability, centrifugal behavior or pressure stability.

In addition to a powerful product range, BECHEM also develops special custom lubricants.

» Lubricants are developed according to customer requirements. «



Test bench for wheel flange lubrication

	PRODUCT						Properties
		Base oil	Thickener	NLGI-grade	Base oil viscosity [mm <sup>2</sup> /s] at 40 °C/100 °C	Service temperature range [°C] <sup>1)</sup>	
Rail lubricants	<b>BECHEM Ecorail EES 46</b> 	Ester	-	-	46 9	-30 +90 +120	Switch lubricating oil, resistant to oxidation and UV radiation, readily biodegradable according to OECD 301 C, approval: DB 959 145, ideal for tramways
	<b>BECHEM Ecorail 2001 Plus</b> 	Synthetic oil combination	Gel	-	11 3	-30 +80	Switch lubricant, readily biodegradable according to OECD 301 C, medium relubrication intervals, medium adhesion, resistant to oxidation and UV radiation, SNCF approval No. IEM 05 004, excellent sprayability, contains light-coloured solid lubricants
	<b>BECHEM Ecorail 2002</b> 	Synthetic oil combination	Gel	-	17 4	-30 +80	Switch lubricant, readily biodegradable according to OECD 301 C, long relubrication intervals, medium adhesion, oxidation and UV resistant, contains light-coloured solid lubricants
	<b>BECHEM Ecorail 2009</b> 	Ester	Bentonite	000*	46 9	-30 +80	Switch lubricant, readily biodegradable according to OECD 301 B, very long relubrication intervals, excellent adhesion, contains light-coloured solid lubricants
	<b>BECHEM Ecorail 2012</b> 	Synthetic oil combination	Lithium/calcium soap	000*	20 6	-30 +80	Switch lubricant, readily biodegradable according to OECD 301 B, very long relubrication intervals, very good adhesion, even for high-speed tracks, for all climatic conditions, contains light-coloured solid lubricants, approval: DB FSF 519 759 (04)
	<b>BECHEM Ecorail 2016</b> 	Synthetic oil combination	Lithium/calcium soap	000*	20 6	-30 +80	Switch lubricant, readily biodegradable according to OECD 301 B, very good adhesion, even for high-speed tracks, for all climatic conditions, contains light-coloured solid lubricants
	<b>BECHEM Ecorail 5501</b> 	Ester	Lithium/calcium soap	1	110 14	-55 +120	Lubrication of rail systems, readily biodegradable according to OECD 301 C, contains light-coloured solid lubricants, high absorption of pressure and shock loads, good adhesion
	<b>BECHEM Ecorail 7010</b> 	Synthetic oil combination	Lithium/calcium soap	0	20 6	-30 +100	Light-coloured buffer disc and high-performance multipurpose grease for locomotives and wagons, readily biodegradable according to CEC L-33-A-93, high load carrying capacity, contains light-coloured solid lubricants
	<b>BECHEM Ecorail 8000</b> 	Ester	Lithium soap	00-000*	50 9	-30 +80	Wheel flange lubricant, readily biodegradable according to CEC L-33-A-93, fluid, without solid lubricants, resistant to oxidation, DB Material No. 526 234 (SSL-3)
	<b>BECHEM Ecorail 8200</b> 	Synthetic oil combination	Lithium/calcium soap	00	35 7,5	-35 +100	Wheel flange lubrication, readily biodegradable according to OECD 301 B, reliable corrosion and wear protection, very high load carrying capacity, good adhesion, high part of light-coloured solid lubricants



BECHEM rail lubricants are used on tracks, switches or wheel flanges.

<sup>\*</sup> Value indicates unworked penetration. <sup>1)</sup> Value marked in grey indicates short term maximum temperature. All indications and values correspond to latest knowledge and do not represent any product specification.

# Good for the environment

BECHEM biodegradable lubricants make an important contribution to environmental protection. They are used in environmentally sensitive areas and are characterized by outstanding technical properties combined with a rapid biodegradability. In the application areas of forestry and construction, rail-bound transport systems and hydraulic engineering systems, the requirements for biodegradable lubricants are steadily rising. Environmentally friendly lubricants and additives from BECHEM meet these high standards and represent an alternative to mineral oil-based products.

Through intensive research and development work as well as investments in national and international research projects, BECHEM has the knowledge to optimally adapt high-performance lubricants to any application. In the BECHEM laboratories, the latest chemical-physical testing and analysis systems are available that are used to characterize lubricants, to monitor their application, to analyze customer problems and finally to develop the appropriate lubricant solutions.



## Awarded – BECHEM lubricants

High quality lubricants are indispensable products which are worth their investment, they are winners of prestigious awards – by making a decisive contribution to performance, energy efficiency and sustainability of products and processes.



Award for Berufluid – a joint project with Fraunhofer Institute IVV and IWF Braunschweig.

BECHEM wins award for tailored solutions in the premium vehicle sector.



BECHEM as an award-winner is one of the 20 most innovative companies in North Rhine-Westphalia.

BECHEM wins the award for innovative lifetime lubrication of different vehicle components.



BECHEM wins the NRW 2015 Efficiency Award for innovative and resource-efficient coating in cold massive forming.

# Lubrication Solutions for Industry



**CARL BECHEM GMBH**

Weststr. 120 · 58089 Hagen · Germany · Phone +49 2331 935-0 · Fax +49 2331 935-1199 · [bechem@bechem.de](mailto:bechem@bechem.de) · [www.bechem.com](http://www.bechem.com)