



Specialty lubricants for
mobile lifting and earth moving machines



BECHEM
LUBRICATION
TECHNOLOGY



Lubricant solutions for large mobile equipment

BECHEM – Lubrication solutions for industry

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


BECHEM products convince 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


Roller bearings 


Plain bearings 


Open gears 

Closed gears 


Chains 


Wire ropes 


Thread lubrication 

Hydraulic 


PROPERTIES


High temperatures 


Low temperatures 

High loads 

Good pumpability 

Resistant to water 


Noise damping 

Compatible with plastics 

Corrosion protection 

Biodegradable 

Available in cartridges 

Available in aerosols 

Maximum performance for large mobile equipment

In the construction, mining and earthworks industries, as well as in transport technology, machines and systems are frequently subjected to extreme operating conditions. Besides environmental influences such as dust, humidity and even extreme variations in temperature, both very high and/or shock loads have to be managed. Machine downtime and possible production loss represent an enormous cost factor, and since redundant systems are in general not available, the selected lubricant is extremely important.

Based on many years of experience, BECHEM has developed the right special lubricants for these tough settings in close collaboration with leading machine manufacturers. By integrating a new generation of high-performance additives, the products extend the service life of the machines and systems thanks to improved wear properties.



Bucket wheel excavator in a coal mine



Wire rope shovel in the Arctic region

Various studies have shown that maintenance costs can be cut by up to 25% through careful lubricant selection and application. BECHEM lubricants reduce power losses, maintenance costs and downtimes while meeting demands for higher efficiency and system availability. For mobile lifting and earthmoving equipment, BECHEM offers a complete range of compatible high-performance lubricants, anti-friction coatings and maintenance auxiliaries, as well as a number of biodegradable products all available worldwide.



Crane in bridge construction

Mining and earthmoving equipment

The excellent mechanical stability, aging stability and very good wear and corrosion protection BECHEM lubricants offer, enable reliable control over high specific loads under the influence of dust and humidity, even at extended relubrication intervals.

With newly developed high-performance additives and their physiochemical reaction with the metal surfaces, the **BECHEM High-Lub FA series** lubricating greases achieve lower friction and wear values. For example, the use of **BECHEM High-Lub FA 50** and **BECHEM High-Lub FA 67-400 KS** has proven to significantly extend the service life of slewing ring bearings.



Overburden conveyor bridge in lignite open cast mining

» Reduce power losses, extend equipment service life. «



Wheel loader in salt mining

Some BECHEM lubricating greases have special synthetic lubricant combinations for use in bearings with very high contact pressures, very slow movements and/or shock loads, typical for equipment in mining and earthworks. This ensures reliable protection of the friction bodies in mixed friction.

BECHEM has developed special lubricating greases for outstanding pumping characteristics at low ambient temperatures in central lubrication systems. In very long central lubrication systems of draglines and overburden conveyor bridges, for years they have guaranteed all lubrication points are supplied reliably. Special partially synthetic high-performance greases are available for use in Arctic regions.



Dragline in open cast mining

Telescoping cranes

At many construction sites throughout the world, telescopic cranes with their high mobility offer convincing performance that makes them essential for many applications. To maintain these functions over the long-term and so that the daily telescoping can function with reduced friction and without stick-slip, an efficient lubrication is indispensable. For high construction projects rotating tower cranes with their lifting technology, as well as fast-erecting cranes or top-slewing cranes likewise bring their strengths to bear. Here as well only a perfect lubrication ensures reliable functionality. Whether in intense heat, freezing temperatures or dusty dryness, in rain, snow or ice – cranes are always exposed to the environmental influences and must be ready for operation at any time under the most varied climatic conditions.

BECEM has developed a broad assortment of high-performance lubricants for cranes that ensure a prolongation of service life, reduction of maintenance costs through extended lubrication intervals, and efficient operation.

Lubrication of telescopic crane booms

The lubricant solutions for telescopic booms are based on highly viscous, extremely adhesive base oils. These special lubricants for telescopic booms with plastic sliding plates contain a high dose of PTFE, giving them the desired friction coefficient for the highly stressed telescopic segments. With **Berulub PAL 1** and **Berulub TCG 1**, BECEM offers high-performance products with a long lifespan that ensure many safe telescopic operations without the need for relubrication that can be used independent of the type of boom or type of crane.

Berulub PAL 1 improves the sliding properties of different material pairings, particularly NF metal/NF metal, metal/elastomer, plastic/plastic, and metal/plastic, and thus avoids stick-slip when telescoping. Thanks to the



synthetic base oil the lubricating grease ensures an excellent bond, and thanks to the PTFE, which is used in the lubricant as a thickener, it ensures reduced friction as well. Environmental influences, as well as temperatures in the implementation range between -40°C and +150°C have no influence on its performance. Due to the NLGI Class 1 rating and the base oil viscosity **Berulub PAL 1** can also be applied with a spray system. **Berulub TCG 1** can even be applied in extreme sub-zero temperatures.

To counteract wear to the metal primer, an inevitable result of the movement of the telescopic boom, BECEM has developed special anti-friction coatings for modern telescopic cranes. Anti-friction coatings are industrial coatings enriched with solid lubricants and additives at a specific pigment volume concentration. Besides improving their functionality, these substances give complex tribological systems such as telescopic constructions dry-running properties in case of insufficient lubrication. They also effectively protect the steel surface from corrosion without affecting the friction values of the lubricant, thus lowering the risk of downtimes significantly.



Anti-friction coating to minimize stick-slip

Berucoat AF 339 is a 2-component PTFE anti-friction coating that was developed as lifetime lubrication of components on cranes, and for tribological optimization of the existing grease lubrication.



The surface coated with Berucoat AF 339 for telescoping is dry to the touch after one hour, can be subjected to load after 3 days, and after 7 days it has cured.

Crane boom segments require corrosion protection for transport to the final assembly location, however this corrosion protection cannot be applied as a Vaseline or wax film, because dust particles remain bonded on the media, and in this case the segments would then have to be cleaned. In extensive salt spray tests with a 5% NaCl solution **Berucoat AF 339** was able to convincingly outperform a zinc primer as corrosion protection. Even after 192 hours the test segment that had been sprayed was free of corrosion.

Berucoat AF 339 with the integrated PTFE is adjusted to the lubricating greases used, such as **Berulub PAL 1**, **Berulub TCG-1** or **Berulub TCG-1 V**. Through this measure, friction can be reduced, stick-slip avoided and a constant low coefficient of friction can be achieved.

Harbor cranes and loading systems

The components of harbor cranes and loading systems are often subjected to the strong corrosive effects of salt water atmospheres. This makes the corrosion protection properties and water resistance of the lubricants used even more important. High loads and in some cases very low speeds in the bearings of many components, as well as the extremely high requirements for system availability, also require high load-carrying properties and excellent mechanical stability of the lubricating greases used.

The lubricating greases of the **BECHEM High-Lub FA 67 series**, which thanks to the use of newly engineered high-performance additives also reliably prevent downtime corrosion, were developed for these special requirements. The formation of ultra effective reaction layers

reduces the friction values in highly stressed roller and plain bearings. This lowers the risk of dynamic forces occurring, which could result in loads shifting. Owing to their excellent mechanical stability, the lubricating greases of the **BECHEM High-Lub FA series** allow for relubrication intervals of several months. This boosts the efficiency of the crane and loading systems significantly.

Developed for the lubrication and preservation of steel ropes, **BECHEM High-Lub SW 2 V** combines the properties of both penetrating rope care lubricants and those that form a protective layer. **BECHEM High-Lub SW 2 V** protects the rope surface from wear and corrosion, as well as corrosion and wire breakage within the rope thanks to its excellent reconditioning effect. The out-



Container loading at sea ports



Gantry crane for loading containers at ports

standing wetting capability of **BECHEM High-Lub SW 2 V** and its high adhesion capacity after solvent evaporation enable long dwell times on the surface of ropes and individual wires, while reducing consumption. Special dewatering additives even enable application on wet steel ropes. **BECHEM High-Lub SW 2 V** in a spray can is available for small wire ropes and chains.



Bulk material loading system at coal ports

Lubricant solutions for bucket wheel excavators

Steel ropes
Beruprotect Rope Dressing
Berulit GA series

Central lubrication system
BECHEM High-Lub LT EP series
BECHEM High-Lub LM EP series
BECHEM High-Lub FA 67 series
BECHEM High-Lub LFB 2000
Beruplex CS 2 EP
Beruplex PMC 42 F
Berulub ECO Super series

Electric motor bearings
BECHEM High-Lub L 3
BECHEM High-Lub LT 3 EP
BECHEM High-Lub FA 67-2
Berutox FE 18 EP

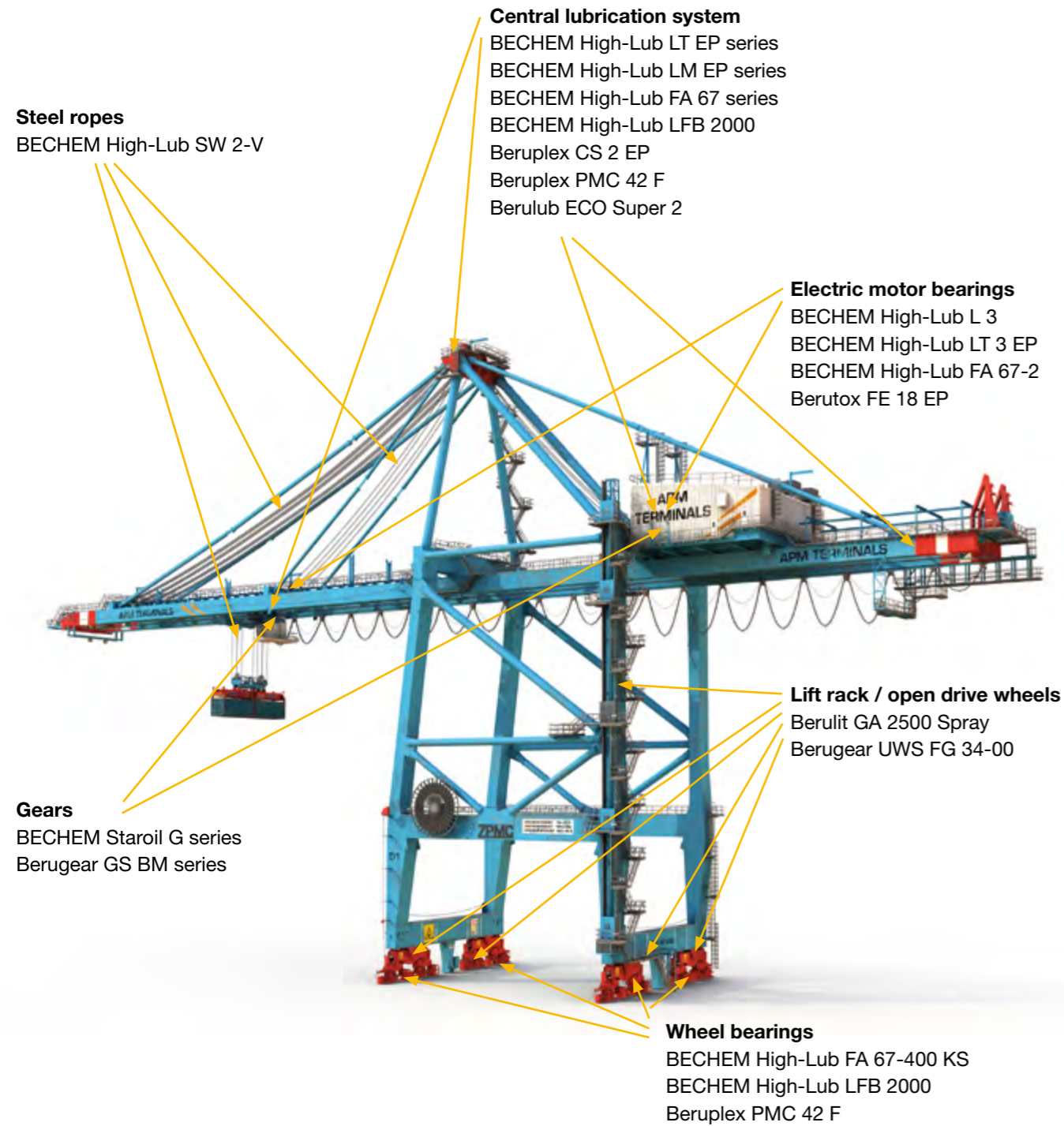
Slewing ring
Berulit GA series

Drive unit gears
BECHEM Staroil G series
Berugear GS BM series
BECHEM Staroil SMO series

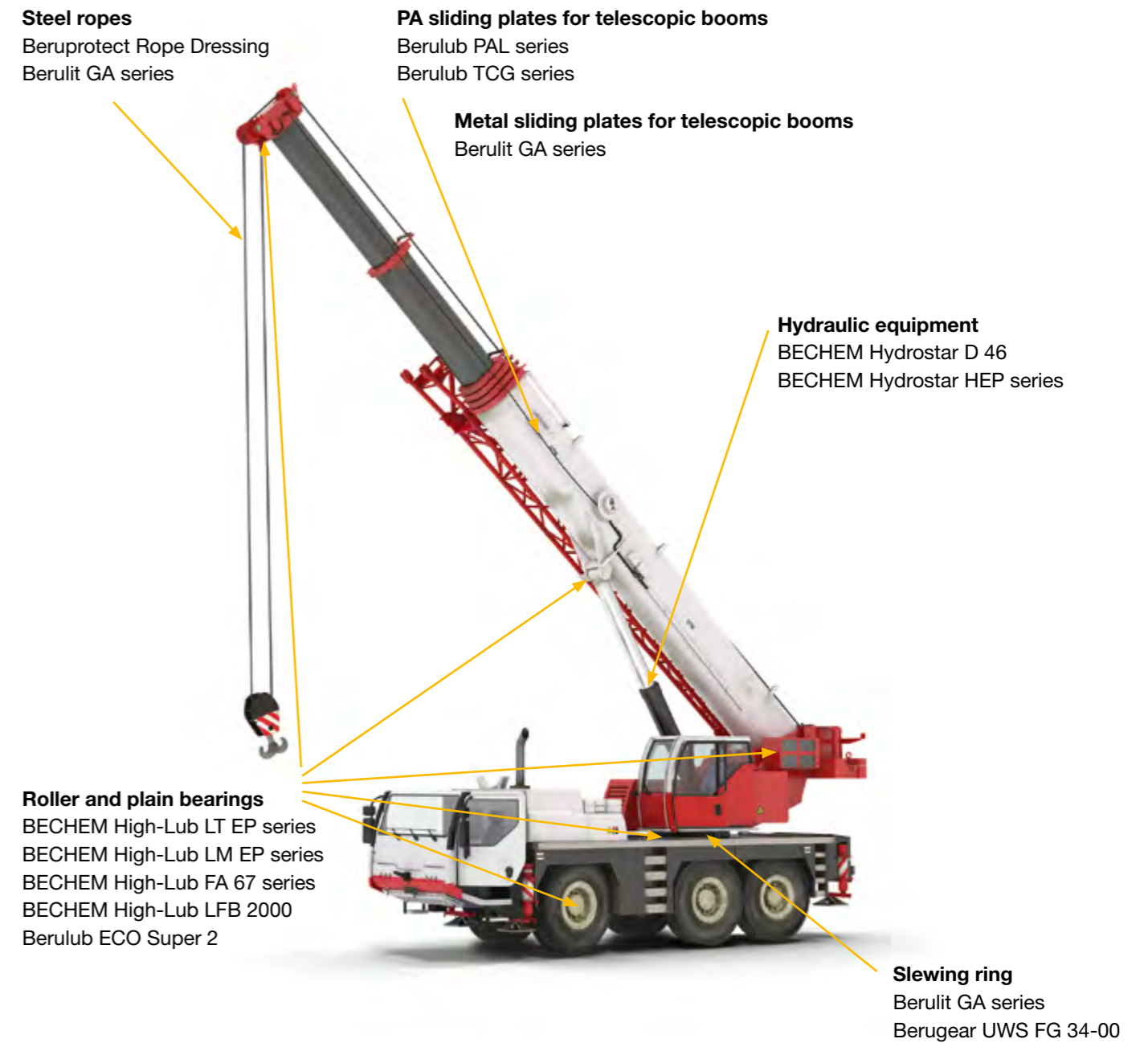
Bucket wheel excavator gears
BECHEM Staroil G series
Berugear GS BM series
BECHEM Staroil SMO series
Berusynth EP series

Tape unit gears
BECHEM Staroil G series
Berugear GS BM series
Berusynth EP series

Lubricant solutions for harbor cranes



Lubricant solutions for mobile cranes



For maximum productivity

In regions with very cold winters, the low temperature behavior of lubricants plays a major role. Besides high requirements on lubrication properties, their conveying behavior is also very important.

BECHEM High-Lub L 2 MO and **BECHEM High-Lub LM 2 EP** offer not only excellent wear and corrosion protection, but also feature outstanding pumping characteristics in the sometimes very long lines of central lubrication systems. **BECHEM High-Lub LM 0 EP** can be used at extremely low temperatures of down to -40°C.

The BECHEM range includes a number of special hydraulic and gear oils. Please inquire about the corresponding products.

Reliable, cost-effective lubrication under tough conditions requires not only the use of high-performance lubricants, but also experience in correct application. BECHEM has the necessary expertise to provide individual consultation to users. BECHEM has also developed a process for analyzing the conveying behavior of lubricating greases in central lubrication systems. This process applying the BECHEM rheometer curve, which is measured using rotation viscometers, offers significant time and cost savings.



Hydraulic excavator in open cast mining

PRODUCT	PRODUCT		NLGI-grade	Kinematic viscosity at 40 °C, 100 °C [mm²/s]	Service temperature range [°C]	Typical applications	Properties
	Base oil	Thickener					
BECHEM High-Lub LT 2 EP 🔧⚙️🔧	Mineral oil	Lithium soap	2	180 15	-30 +140	Roller and plain bearings, central lubrication systems in the normal temperature range	Multi-purpose EP-grease, wide application temperature range, excellent water resistance, excellent corrosion and wear protection, excellent pumpability in central lubrication systems
BECHEM High-Lub LM 2 EP 🔧⚙️🔧	Mineral oil	Lithium soap	2	105 10	-40 +140	Roller bearings and plain bearings, central lubrication systems at low ambient temperatures	Long-term lubricating grease, excellent pumpability in central lubrication systems, excellent water resistance, EP-properties, good low-temperature properties, corrosion protection
BECHEM High-Lub LM 0 EP 🔧⚙️🔧	Mineral oil	Lithium soap	0	105 10	-40 +140	Roller bearings and plain bearings, central lubrication systems at low ambient temperatures	Long-term lubricating grease, good pumpability in central lubrication systems, excellent water resistance, EP properties, good low-temperature properties, corrosion protection
BECHEM High-Lub L 2 MO 🔧⚙️🔧	Mineral oil	Lithium soap	2	100 9	-30 +120	Pivot bearings, central lubrication systems at low ambient temperatures	Heavy-duty/long-term lubricating grease, good temperature resistance, excellent pumpability and water resistance, high load-carrying capacity through solid lubricants and EP-additives
BECHEM High-Lub LFB 2000 🔧⚙️🔧	Mineral oil	Lithium soap	2	180 15	-20 +140	Pivot bearings, central lubrication systems in the normal temperature range	EP-grease, wide application temperature range, excellent pumpability and water resistance, excellent corrosion and wear protection, contains light-colored solid lubricants, emergency running properties
BECHEM High-Lub SW 2 🔧⚙️🔧	Mineral oil	Special calcium soap	1-2	100 9	-25 +80	Roller bearings and plain bearings, mechanisms in a wet environment or saltwater atmosphere	Corrosion protection grease for roller bearings, plain bearings, and ropes, for aggressive ambient conditions, extremely high level wear protection through EP-additives, water-resistant, excellent corrosion protection, excellent pumpability
BECHEM High-Lub FA 67-400 KS 🔧⚙️🔧	Mineral oil	Lithium-Calcium-Soap	2	400 30	-20 +140	Slewing gear main bearings, wheel bearings, pivot bearings in the normal temperature range	Long-term lubricating grease, good sealing qualities, excellent water resistance, outstanding corrosion protection, good pumpability in central lubrication systems, EP-properties
BECHEM High-Lub FA 50 MO 🔧⚙️🔧	Mineral oil	Lithium-Calcium-Soap	2	1200 47	-20 +120	Extremely heavy-duty slewing ring main bearing and joint bearing	Long-term lubricating grease for high to very high loads, excellent water resistance, excellent corrosion protection, even if there is risk of standstill corrosion, highly viscous mineral oil, contains solid lubricants and EP-additives
Beruplex CS 2 EP 🔧⚙️🔧	Mineral oil	Calcium complex soap	2	150 13	-25 +140	Electric motors and fan bearings under thermal load	EP-grease, wide application temperature range, excellent water resistance, excellent corrosion protection, excellent pumpability in central lubrication systems, high load-carrying capacity
Beruplex PMC 40 F 🔧⚙️🔧	Mineral oil	Special calcium complex soap	0	440 26	-20 +140	Sump lubrication of bucket chain bearings	Chain lubricant for high to extremely high loads, good water resistance and pumpability, excellent corrosion protection, contains solid lubricants and EP additives
Beruplex PMC 42 F 🔧⚙️🔧	Mineral oil	Special calcium complex soap	1-2	400 26	-20 +140	Extremely heavy-duty pivot bearings, roller bearings, and plain bearings in the normal temperature range	Roller and plain bearing grease for high to very high loads, excellent water resistance and pumpability, excellent corrosion protection, contains solid lubricants and EP-additives
Berutox M 21 KN 🔧⚙️🔧	Mineral oil	Polyurea	1-2	490 32	-20 +180	Roller and plain bearings under thermal load	Long-term lubricating grease, outstanding consistency-temperature-behavior, excellent resistance to water, excellent corrosion and wear protection, EP-properties
Berutox FB 22 🔧⚙️🔧	Polyalphaolefin (PAO)	Barium complex soap	2	50 8	-40 +180 +200	Electric motors and fan bearings under thermal load	For long-term lubrication at high speeds, good consistency-temperature-behavior, excellent water resistance, excellent corrosion and wear protection, good pumpability
Berulub ECO Super 1 🔧⚙️🔧	Synthetic ester	Lithium-Calcium-Soap	1	110 14	-55 +120	Roller bearings and plain bearings, central lubrication systems at normal and low ambient temperatures	Lubricating grease, reliable corrosion protection, resistant to water, contains solid lubricants, readily biodegradable according to OECD 301 C
Berulub ECO Super 2 🔧⚙️🔧	Synthetic ester	Lithium-Calcium-Soap	2	110 14	-45 +120	Roller bearings and plain bearings, central lubrication systems at normal and low ambient temperatures	Lubricating grease, reliable corrosion protection, resistant to water, contains solid lubricants, readily biodegradable according to OECD 301 B

¹Value marked in gray indicates short term maximum temperature. All data and values correspond to the current state of knowledge and serve as guidance only.

Technical service

BECHEM offers customers using its products comprehensive technical services, with a global network of service centers with trained technicians on call. Technical service may include the following items according to the respective agreements:

- Regular technical inspections
- Lubricant management and consultation
- Sampling and analysis of lubricant samples
- Creation of lubrication charts determining the monitoring or failure criteria
- Support during repair work
- Optimization of lubricant consumption values
- Support in optimizing lubrication systems



PRODUCT	PRODUCT		NLGI-grade	Kinematic viscosity at 40 °C, 100 °C [mm²/s]	Service temperature range [°C]	Typical applications	Properties
	Base oil	Thickener					
Berulub PAL 1 	Ester	Polytetrafluoroethylen (PTFE)	1*	2200 180	-40 +150	Telescopic booms of cranes and loading systems with PTFE sliding plates	Multi-purpose, low-temperature paste prevents stick-slip, extends relubrication intervals, excellent adhesion, media-resistant, contains PTFE, optimally suited for contact combinations of metal with PTFE/PA
Berulub PAL 3 	Ester	Polytetrafluoroethylen (PTFE)	3*	5000 340	-20 +150	Telescopic booms of cranes and loading systems with PTFE sliding plates	Multi-purpose, low-temperature paste prevents stick-slip, extends relubrication intervals, excellent adhesion, media-resistant, contains PTFE, optimally suited for contact combinations of metal with PTFE/PA
Berulub TCG 1 	Synthetic oil combination	Polytetrafluoroethylen (PTFE)	1*	4100 320	-40 +150	Telescopic booms of cranes and loading systems with PTFE sliding plates	Multi-purpose paste, prevents stick-slip, low-temperature suitability, high load-carrying capacity, excellent adhesion, contains PTFE, optimal for contacts of metal with PTFE/PA, also available as sprayable multi-purpose paste (Berulub TCG-1 V)
Berulub Palfluid Spray 	Ester	Polytetrafluoroethylen (PTFE)	3*	5000 340	-20 +150	Telescopic booms of cranes and loading systems with PTFE sliding plates	Multi-purpose, low-temperature paste prevents stick-slip, extends relubrication intervals, excellent adhesion, media-resistant, contains PTFE, optimally suited for contact combinations of metal with PTFE/PA
Berulit 443 	Mineral oil	Aluminium complex soap	2	260 16	-20 +180	Telescopic booms of cranes and loading systems with metal sliding plates, manual lubrication of gear rims	Priming lubricant for open gear drives and lubricating paste, very high graphite content, excellent wear protection, good adhesion, high load-carrying capacity, not sprayable
Berulit GA 400 → 2500 	Mineral oil, Mineral oil/ Synthetic oil	Aluminium complex soap	0-00 0-00 00	490/32 1050/43 2500/100	-20 +180 -10 +180 +5 +200	Open drives and gear rims in case of application with lubrication systems	Operating lubricant for open gear drives, extremely high base oil viscosity excellent wear protection, extremely high load-carrying capacity, good adhesion, contains graphite, preferably applied by spray equipment (2500)
Berugear UWS FG 34-00 	Synthetic ester	Lithium-Calcium-Soap	00	320 40	-50 +80	Open drives and gear rims in case of application with lubrication systems	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
Berulub Paste PT 2 	Mineral oil	Polyurea	2	150 11	-30 +150 +200	Heavy-duty plain bearings and pivot bearings, bolts, bushes, spindles and guides subject to extremely high load	Multi-purpose lubricating and assembly paste, prevents tribocorrosion and stick-slip, cream-colored
Berulub MG Paste 	Mineral oil	Gel	2-3	480 35	-20 +450	Lubrication, sealing and preservation of screws, etc., drylubrication at high temperatures	Multi-purpose assembly paste with MoS ₂ , prevents stick-slip and running-in damage, protects against fretting corrosion, high thermal stability, water resistant
Berulit IKP 	Mineral oil			115	-20 +160	Chains and mechanisms in dusty environments	Chain oil to lubricate slow-moving transport and conveyor chains with large chain links, high load-carrying capacity, low dust binding, excellent wear and corrosion protection, contains graphite
BECHEM High-Lub SW 2 V 	Mineral oil	Special calcium soap	1-2	100 9	-25 +80	Wire ropes, chains and mechanisms in humid environments or salt water atmosphere	Corrosion protection grease for aggressive ambient conditions, extremely high level wear protection through EP additives, water-resistant, excellent corrosion protection, excellent pumpability
Beruprotect Rope Dressing 	Mineral oil		1-2	9	-20 +100	Wire ropes in extremely dusty environments	Wire rope lubricant, fluid, good creeping properties, excellent wear and corrosion protection, outstanding adhesion, excellent wetting properties
Berulit GA 2500 Spray 	Mineral oil/ Synthetic oil	Aluminium complex soap	00	2500 100	-20 +200	Telescopic booms and loading systems with metal sliding plates, small open drives and gear rims	Operating lubricant optimally suited for sliding contacts metal/metal, excellent wear protection, excellent adhesion, high load-carrying capacity, solid lubricant graphite
Berulit Gear Spray 	Mineral oil					Small open drives and gear rims	Sprayable lubricant, good wear and corrosion protection, outstanding adhesion, resistant to water and water repellent
Berulub ECO GD 40 Spray 	Ester				-30 +90	Rust solvent, corrosion protection, cleaning and maintenance agent	Multifunction spray, readily biodegradable according to OECD 301 C, acid and resin free, odorless, water repellent, good creeping properties
Beruclean ECO 	Polyalphaolefin (PAO)					Removes oil and grease soiling, waxes, resins, bitumen, tar and oil carbons	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
Berucoat AF 339 					-70 +250	Anti-friction coating for priming telescopic booms	2-component PTFE anti-friction coating for lifetime lubrication, particularly for tribological optimization of the existing grease lubrication, excellent adhesion, outstanding corrosion protection, oil-resistant and grease-resistant

*Value refers to the unworked penetration [†]Value marked in gray indicates short term maximum temperature. All data and values correspond to the current state of knowledge and serve as guidance only.

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 · www.bechem.com