Special lubricants for the cement and lime industry, open cast mining and mineral processing

BECHEM
LUBRICATION
TECHNOLOGY

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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

- Roller bearings
- Plain bearings
- Open gears
- Closed gears
- Hydraulic
- Chains
- Wire ropes

PROPERTIES

- High loads
- Low temperatures
- High temperatures
- Resistant to water
- Good pumpability
- Noise damping
- Corrosion protection
- High speed
- Biodegradable

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

Under all conditions

In the cement and lime industry, as well as in mining and mineral processing, machines and equipment are often exposed to extreme working conditions. Besides environmental influences such as dust, humidity and 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 years of experience gathered in close cooperation with leading machine manufacturers, BECHEM has developed special lubricants for these demanding conditions.

BECHEM High-Lub LM series lubricating greases are designed for use at very low ambient temperatures and ensure reliable, efficient lubrication of heavy open-cast mining equipment, even at temperatures far below the freezing.

Lubricating greases for roller and plain bearings

The very good wear and corrosion protection as well as the excellent mechanical stability of BECHEM lubricating greases help to cope with high specific loads. Even at extended re-lubrication intervals, there will be hardly any negative influence caused by dust and humidity.

Based on the use of innovative high-performance additives and their physical-chemical reaction with the metal surfaces, the greases of the **BECHEM High-Lub FA series** guarantee better wear protection and a reduced friction value.
Unlike other lubricating greases, the lubricating grease **BECHEM High-Lub FA 67-400 KS** can significantly extend the service life of slewing ring bearings in hydraulic excavators, despite low consumption rates, for example.

Some lubricating greases contain synergizing solid lubricant combinations to enable use in challenging applications in bearings with very high surface pressures, low speeds and/or shock loads. One typical example is the lubrication of joint bearings of vertical roller mills. When using **BECHEM High-Lub FA 50 MO** or **Beruplex PMC 42 F** the combination of high loads, vibrations and small swivel angle can be safely controlled and the service life of the spherical plain bearings can be significantly extended.

Tension rod bearing of a vertical roller mill

BECHEM high-performance greases

Tried and tested in:

- Main bearings of roller presses and crushers
- Main and pivot bearings of vertical roller mills
- Pinion, trunnion and support roller bearings of mills and rotary kilns
- Pivot and slew ring bearings of excavators
- Main bearings of fans and blowers
- Bearings of vibration screens and sorting plants
- Roller and tensioning roller bearings of conveyor systems

BECHEM high-temperature greases

Tried and tested in bearings of:

- Clinker coolers and cooling beds
- Clinker and ore conveying systems
- Converters and ladle furnaces
- Exhaust and hot air fans
- Filter and de-dusting equipment

The BECHEM open gear lubrication system

Due to low speeds and very high torque to be transmitted, and the fact that hydrodynamic lubrication conditions are barely attainable, the tooth flanks of open gear drives are at risk of damage.

Premature tooth flank damage can result from insufficient drive supply with lubricant, the use of unsuitable lubricant, inadequate accuracy in aligning the drive as well as temperature-dependent and load-dependent deformation, even when using high-quality materials. Precision alignment, a carefully carried out running-in process and highly sophisticated lubricants can prevent or minimize such damage.

Based on many years of experience, BECHEM has developed gear greases, high-viscosity fluids and gear oils that reliably meet the different needs of the drives in terms of dimension, weight, torque to be transmitted, use and ambient conditions and even the way the lubricant is applied. With BECHEM high-performance lubricants and the expertise of technical BECHEM services, improved tooth flank protection can be ensured while reducing consumption rates.

Large open gear drives can only operate safely if contact pattern and surface quality have been optimised by running-in processes. Only the perfect synergy between an increased contact pattern and lower surface roughness increases the infinite compression strength and scuffing load capacity of the tooth flanks, thus extending their service life. These running-in processes require special products which, together with BECHEM service lubricants, form a complete system.

The BECHEM running-in and service lubricants harmonise so that cleaning after each individual process is not necessary. Custom products are available on request for the treatment of special tooth flank.

Adhesive lubricants containing graphite have proven to be most effective for many open drives. For these drives, BECHEM has developed the **Berulit open gear lubricant system.** It is based on a very stable metal complex soap and contains selected solid lubricants as well as a combination of special additives. The high graphite content in the products protects the flanks even under lubricant starvation conditions.

For other drives, high-viscosity gear fluids perform better. The BECHEM **Berugear HV series** lubricants are designed specifically for use in drives with higher requirements concerning operational viscosity, life of lubricating film, thermal stability, low lubricant consumption rates as well as easier discharge of the consumed lubricant.

Slewing gear of a bucket wheel excavator lubricated with Berulit GA 2500

BECHEM adhesive lubricants

BECHEM lubricant systems offer reliable protection for open drives of:

- Ball, rod, AG and SAG mills
- Rotary kilns and coolers
- Mixing drums and dryers
- Hydraulic, bucket wheel and wire rope excavators
- Crushers, stacker and reclaimer systems
- Cranes, hoists, spreaders and belt conveyors
- Ladles and converters
- Pelletizer disks and drums

All major manufacturers have given their approval.

High-performance oils

Sustainability is part of the BECHEM company philosophy. Conserving resources by reducing frictional losses and extending the oil service life therefore also play a crucial role in lubricant development. The result: innovative mineral-oil-based and synthetic high-performance oils developed with the future in mind.

With the use of these oils in closed gearboxes and circulation systems, it was possible to reduce lubricant related power losses by 3 - 5 %. In addition, oil sump temperatures can be reduced as well. Typical fields of application are:

- Ball, rod, AG and SAG-mills
- Rotary kilns, coolers and dryers
- Vertical roller mills and roller presses
- Bucket wheel excavators and draglines
- Crushers, stackers and reclaimer systems
- Cranes, hoists, stacker and belt conveyors
- Transport and conveyor belt systems
- Converters and ladles

We recommend the use of synthetic gear oils for gears with permanent operating temperatures above 80 °C. At higher temperatures, the oils of the **Berusynth EP** and **Berusynth GP** series achieve a lifetime that is four times higher than that of mineral oils. Their load-carrying capacity by far exceeds the performance of conventional gear oils.

With the oils of the **Berugear GS BM series**, BECHEM offers products with increased resistance to micro pitting, based on a high-performance PD additive system. This system allows the formation of reaction layers with an extreme high-pressure capacity. Thus, micro-plastic deformation of surface roughness asperities and slight damages without any considerable material loss is possible at high specific flank pressures.

In view of this process and the related increased contact pattern, these products can also be used as running-in oils. Polar additives improve the wetting and adhesion properties of the oils. The reaction layers formed on the surface reduce the friction coefficient in the tooth contact and hence the power loss in the gearbox.

High-temperature fluid for floating tyres of rotary kilns

The high-temperature fluid **Berulub VPN 13 Ringlub** is used for internal and flank lubrication of floating tires based on its unique combination of solid lubricants. It does not ignite on hot kiln surfaces and forms very small amounts of smoke. The carrier fluid has one of the highest auto-ignition temperatures among comparable products containing oil and offers protection against flame formation even at kiln shell temperatures of over 400 °C. Its slow evaporation rate enables reliable supply to all contact points, even in the center of the tires.

After evaporation of the synthetic carrier fluid, it forms a resistant, dry film on the metal surface that efficiently protects against scuffing and wear.

The synergizing combination of solid lubricants with a high degree of soft metal particles also ensures much longer re-lubrication intervals compared with competitor products.

Berulub VPN 13 Ringlub can be applied by manual spraying devices or stationary spraying systems. For ideal application, BECHEM offers the **Compression Sprayer 3591 PU**, a manual spraying system tailored to the product. For initial lubrication during assembly, BECHEM recommends **Berulub VPN 13** paste.

Application of Berulub VPN 13 Ringlub
with the BECHEM Compression sprayer

Well-lubricated tire at a rotary kiln

Chain lubricants

Chains run under mixed friction conditions. When applied properly, BECHEM high-performance chain lubricants ensure reduced friction and wear, good wetting and creep properties, and efficient consumption. The natural adhesive capacity thanks to polar properties guarantee lowest oil consumption and avoid dripping and centrifuging off of the oil in case of correct dosage.

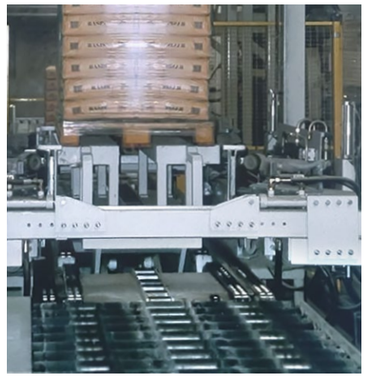
While good wear and corrosion protection can be achieved in round steel chains with large links with adhesive semi-fluid greases such as the **Berulit GA series** or highly viscous products from the **Berusynth CU** and **Berugear HV series,** in smaller to medium-sized roller and bush chains, the creeping capacity and wetting capability of the chain lubricant play a deciding role.

Lubricants used for transmission and transport chains running in dusty environments have to offer high load-carrying capability and excellent wear and corrosion protection and simultaneously prevent the strong adhesion of dust.

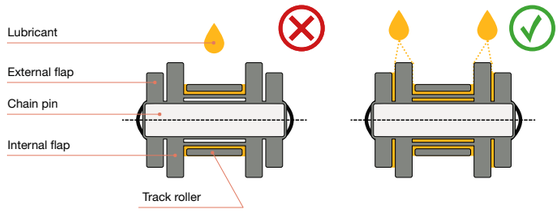
Frequently, the short service life of chains in very dusty environments is caused by the use of an incorrect and often dust-binding lubricants. **Berulit IKP** chain oil offers efficient, reliable protection for chains in dusty environment.

The **Berusynth CU** and **Berusynth CP series** high-performance chain oils were designed for applications at very high temperatures. Thanks to their low evaporation rate, low tendency to residue formation and excellent lubrication properties, chains can be supplied with extremely small amounts of oil for maximum efficiency and cleanliness.

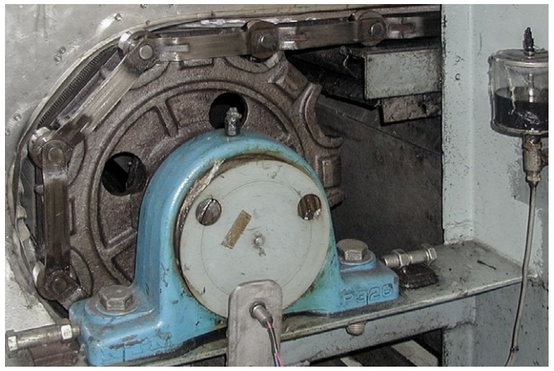
Developed for chains exposed to water, **BECHEM High-Lub SW 2 V** can be applied to wet chains thanks to its water-repelling properties and features extremely high adhesion as well as outstanding corrosion protection properties.



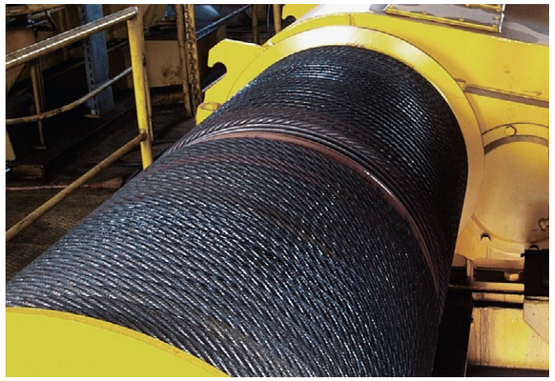
Sack palletizing:
Use of Berulit IKP
in chain lubrication



The BECHEM chain oil has to be applied in a way that it directly reaches the chain link along the internal and external flaps and the flap edges to lubricate the point of friction.



Wire rope lubricants



Wire ropes on cranes, excavators and transport systems are important functional components with increased requirements for reliable corrosion and wear protection that have to be re-lubricated during use due to the stresses they are exposed to. The BECHEM special lubricants used extend the service life of wire ropes with their combination of high adhesion on the rope surface and an outstanding penetration capability to prevent corrosion and minimize friction between the wires and strands.

The number of visible wire breaks on the wire surface essentially determine when the wire has to be replaced. Other damage, such as loops due to insufficient lubrication between the wires, also represent a discard criteria for wire ropes. But micromovements often also result in fretting corrosion inside stationary and running wire ropes due to insufficient lubrication. This is where the penetration capability of a wire rope lubricant comes into play.

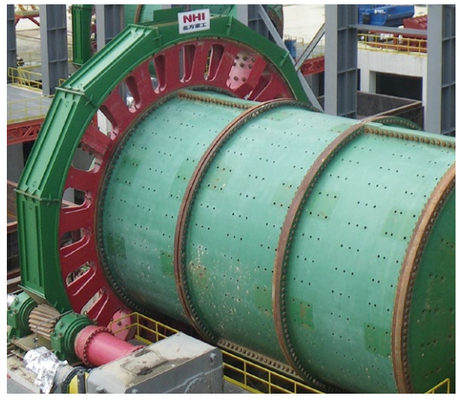
With lubricants for wire ropes, a differentiation is made between products that form a protective layer and penetrating products. Wire rope lubricants that form a protective layer only penetrate to a limited extent, but ensure excellent wear protection for the rope surface and seal the wire rope against penetrating liquids, reducing the risk of corrosion. The products from the **Berulit GA series** are special coating lubricants that can be used in a wide range of applications.

Beruprotect Rope Dressing is a penetrating wire rope lubricant for very dusty environments providing excellent protection inside the rope. On the surface, the lubricant forms a very thin, touch-dry film, preventing dirt from adhering to the surface.

Developed for the lubrication and preservation of steel ropes in humid or corrosive environments, **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 outstanding 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.

Lubricants for special applications

Material crushing, ball mill



Machine part	Lubrication point	BECHEM special lubricants
Open gears	Pinion, sprocket	**Berulit GA series** **Berugear HV series**
Closed gears	Self-aligning pinion, sprocket	**BECHEM Staroil G series**
Pinion bearings, mill neck bearings	Bearings oil-lubricated	**BECHEM Staroil G series**
	Roller bearings grease-lubricated	**BECHEM High-Lub FA 50 MO** **Beruplex PMC 42 F**
Slide shoe bearing	Bearings oil-lubricated	**BECHEM Staroil G series**
Main gears	Gears	**BECHEM Staroil G series** **Berugear GS BM series** **Berusynth EP series**

Pre-heating/combustion process, rotary kilns

Machine part	Lubrication point	BECHEM special lubricants
Guide and axial rollers	Roller bearings grease-lubricated	**BECHEM High-Lub FA 50 MO** **Beruplex PMC 42 F**
	Roller bearings oil-lubricated	**BECHEM Staroil G series** **Berusynth GP series** **Berusynth EP series**
Spacers, supports, inner tires	Slideway	**Berulub VPN 13 Ringlub**
Open gears	Pinion, sprocket	**Berulit GA series** **Berugear HV series**
Furnace seal	Slideway grease-lubricated	**Berulit GA series** **Beruplex CS 2 EP** **Berutox M 21 KN**

Material crushing, roller presses

Machine part	Lubrication point	BECHEM special lubricants
Frame	Slideway, slide rail	**BECHEM High-Lub FA 40 MO** **BECHEM High-Lub FA 50 MO** **BECHEM High-Lub FA 67-400 KS**
Main bearing	Roller bearings grease-lubricated	**BECHEM High-Lub FA 50 MO** **BECHEM High-Lub FA 50 MO 1**
	Roller bearings oil-lubricated	**BECHEM Staroil G series** **Berusynth GP series**
Hydraulics	Piston	**Hydrostar D 46**
Main gears	Planetary gear [1], gears	**[1]Berusynth EP series** **BECHEM Staroil G series** **Berugear GS BM series**
Electromotor	Roller bearings	**Beruplex LI EP 2** **Berutox FE 18 EP**

Material crushing, vertical mill with separator

Gebr. Pfeiffer SE, Kaiserslautern, Germany

Machine part	Lubrication point	BECHEM special lubricants
Separator	Roller bearings	**Berutox M 21 KN** **Berutox FH 28 EPK 2**
Grinding roller	Roller bearings	**Berusynth EP series** **Berusynth GP series** **BECHEM Staroil G series**
Grinding roller, rocker	Roller bearings	**BECHEM High-Lub FA 40 MO** **BECHEM High-Lub FA 50 MO** **BECHEM High-Lub FA 67-400 KS**
Axial bearing	Pressure elements	**BECHEM Staroil G series**
Hydraulics	Piston	**BECHEM Staroil NR series**
Main drive	Gears	**BECHEM Staroil G series**
Electromotor	Roller bearings	**Beruplex LI EP 2** **Berutox FE 18 EP**

Lubricant solutions for bucket wheel excavators

To achieve high performance, not only the components of bucket wheel excavators, but also the various lubricants used have to be carefully fine-tuned to ensure smooth production processes, as they are primarily supplied via central lubrication systems.

For central lubrication with very long supply lines, BECHEM has developed special greases that can be delivered reliably, even at low ambient temperatures. BECHEM gear oils and adhesive lubricants can be used for a wide range of drives.

Lubricants for crushers and vibration screens

The lubrication of the main bearings in crushers and vibration screens is a demanding challenge. Due to high, shock-like loads, difficult ambient conditions with fluctuating temperatures, dust, possible effects of water and in some cases a vertical bearing arrangement, the lubricants used have to feature a very high mechanical and thermal stability, good adhesion and excellent corrosion protection properties.

In many cases, reliable protection can only be ensured with lubricant based on highly viscous base oils or with a percentage of solid lubricants.
BECHEM has developed special lubricants for crushers and vibration screens.

Application	NLGI class	Normal temperature range	Low temperature range
Vibration screens	2	**BECHEM High-Lub FA 67-400 KS** **BECHEM High-Lub LFB 2000** **Beruplex LI-EP 2**	**BECHEM High-Lub LM 2 EP** **Berutox FH 28 EPK 2**
Hammer, jaw, impact, cone and gyratory crushers	2	**BECHEM High-Lub FA 67-400 KS** **BECHEM High-Lub LFB 2000** **Beruplex PMC 42 F**	**BECHEM High-Lub LM 2 EP** **Berutox FH 28 EPK 2** **Berulit FH 28 G**
Hammer, jaw, impact, cone and gyratory crushers	00	**BECHEM Ceritol CS 415 EP** **BECHEM High-Lub LT 0 EP** **Beruplex PMC 40 F** **Berutox M 21 EPK 420**	**BECHEM High-Lub LM 0 EP** **Berutemp PA 415 GR**

Limestone crusher in a cement plant

Technical service

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 knowledge necessary to offer you global technical services. Based on the results of detailed machine and plant inspections, BECHEM technicians develop optimization suggestions for more effective lubricant application in order to increase the availability and efficiency of your plants.

Technical service may include the following items according to the respective agreements:

Lubricant management and consultation

Support in selecting the best solution from a technical and economic perspective to meet lubricant challenges as well as lubricant management and reduction in inventory. Developing concepts for lubricant application, including recommendations for re-lubrication intervals as well as comparative cost analyses.

Regular technical inspections

Inspection of gearboxes, open gear drives, roller and plain bearings, chains, wire ropes and other machine parts at agreed intervals, including a detailed report and recommendation for further operation.

Sampling and analysis of lubricant samples

In many cases, analyses of lubricant samples as part of the extended BECHEM service enable early detection of negative developments in components or the lubricants used, preventing unscheduled system downtime. Based on the test results and taking the operating conditions into consideration, BECHEM recommends thresholds for lubricant application. Regular sampling can be ordered but also comprehensive compatibility tests with materials or other lubricants in the BECHEM laboratory.

Selection of monitoring values or thresholds

Determining the optimal application of monitoring limits and thresholds with regard to design, accessibility and operating conditions as well as documentation of performance.

Optimization of lubricant consumption values

Checking the application of BECHEM lubricants for optimization potential. If any possibilities are identified, we work with you to carry out optimizations. The service life of oil in circulation systems can be extended with the advanced BECHEM analysis service.

Optimization of lubrication systems

BECHEM offers support in any possible improvements to lubrication systems. The BECHEM rheometer curve was developed to assess the pumpability of lubricating greases in central lubrication systems. With this special method, flow curves are measured much faster and more cost-effectively using rotation viscometers.

Training service

BECHEM offers you technical training on the general basics of tribology and lubrication technology, lubricants and handling them, lubricant selection and special applications. These training courses are carried out as part of regular seminars and are tailored to your specific needs.

Service for open gear drives

For open gear drives, BECHEM offers a comprehensive service package with regular inspections, including inspection of tooth flanks, housings, lubrication systems, contact pattern or the lubricating film. When possible from a technical perspective, the tooth flank temperatures and vibrations are measured. If necessary, recommendations for more efficient adjustment of the lubrication systems are provided.

When carrying out running-in processes and repairing damaged tooth flanks, BECHEM is at your side with specially trained technicians.

Lubricating greases

Special mineral-oil-based and synthetic high-temperature greases with a very high thermal resistance are used for bearings subjected to high thermal loads during processing and smelting. Very thermally stable base oils enable applications at temperatures of up to 300 °C with the necessary re-lubrication. For applications above 300 °C, we recommend using high-temperature greases with selected solid greases.

Berutox FH 28 KN is a multi purpose high-temperature grease that has proven itself in the bearings of separators, fans, charging and exhaust systems. In the FAG-FE-9 roller bearing test at 160 °C it achieves a service life seven times of that of conventional high-temperature lubricating greases.

PRODUCT	Base oil	Thickener	NLGI-grade	Kinematic viscosity [mm²/s] at 40 °C / 100 °C	Service temperature range [°C] [1]		Description
BECHEM High-Lub LT 0 → 3 EP	Mineral oil	Lithium soap	0–00 1 2 3	180 15	-20 -30 -30 -20	120 140 140 140	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 0 → 3 EP	Mineral oil	Lithium soap	0 2 3	105 10	-40 -40 -30	140 140 140	Long-term lubricating grease, good low-temperature properties, excellent pumpability in central lubrication systems, excellent water resistance, EP-properties, corrosion protection *
BECHEM High-Lub L 2 MO	Mineral oil	Lithium soap	2	100 9	-30	120	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	EP-grease, wide application temperature range, excellent pumpability and water resistance, excellent corrosion and wear protection, contains light-colored solid lubricants, emergency running properties
Berulub ECO Super 2	Synthetic ester	Lithium-Calcium-Soap	2	110 14	-45	120	Lubricating grease for roller and plain bearings, readily biodegradable according to OECD 301 B, reliable protection against corrosion, resistant to water, contains solid lubricants
BECHEM High-Lub SW 2	Mineral oil	Special calcium soap	1–2	100 9	-25	80	Corrosion protection grease dispersion with highly volatile solvent and dewatering additives for ropes, roller and plain bearings, for aggressive ambient conditions, extremely high level wear protection through EP additives, water-resistant, excellent corrosion protection, excellent pumpability
BECHEM High-Lub FA 67-2	Mineral oil	Lithium-Calcium-Soap	2	100 11	-30	130	Long-term lubricating grease, excellent corrosion and wear protection, suitable for high loads and high speeds, excellent water resistance and pumpability
BECHEM High-Lub FA 67-400 KS	Mineral oil	Lithium-Calcium-Soap	2	400 30	-20	140	Long-term lubricating grease, good sealing qualities, excellent water resistance, outstanding corrosion protection, even if there is risk of standstill corrosion, good pumpability in central lubrication systems, EP-properties
BECHEM High-Lub FA 50 MO	Mineral oil	Lithium-Calcium-Soap	2	1200 47	-20	120	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	EP-grease, wide application temperature range, excellent water resistance, excellent corrosion protection, excellent pumpability in central lubrication systems, high load-carrying capacity
Beruplex KS 22	Mineral oil	Special calcium complex soap	1–2	160 13	-30	150 180	EP-grease, extremely wide application temperature range, excellent corrosion protection, excellent pumpability, excellent water resistance and adhesion, excellent sealing qualities
Beruplex PMC 40 F	Mineral oil	Special calcium complex soap	0	440 26	-20	140	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	High-performance grease for high to very high loads, excellent water resistance and pumpability, excellent corrosion protection, contains solid lubricants and EP-additives
Berutox FE 18 EP	Mineral oil	Polyurea	2	100 11	-20	140	High-performance grease to lubricate high-speed roller and plain bearings, excellent water resistance, excellent corrosion and wear protection, excellent pumpability
Berutox M 21 KN	Mineral oil	Polyurea	1–2	490 32	-20	180	Long-term lubricating grease, outstanding consistency-temperature-behavior, excellent resistance to water, excellent corrosion and wear protection, EP-properties
Berutox FH 28 KN	Polyalphaolefin (PAO)	Polyurea	1–2	400 40	-30	180 200	Synthetic long-term lubricating grease, outstanding consistency-temperature behavior, excellent chemical and water resistance, excellent corrosion and wear protection, EP-properties, H2 registered
Berutox FB 22	Polyalphaolefin (PAO)	Barium complex soap	2	50 8	-10	180 200	For long-term lubrication at high speeds, good consistency-temperature-behavior, excellent water resistance, excellent corrosion and wear protection, good pumpability

[1] Value marked in grey indicates short term maximum service temperature *NLGI grade 2 and 3

Adhesive lubricants, lubricating oils and special applications

Besides reliable lubrication, fast and effective cleaning of components and machines plays an important role in daily maintenance. The products in the Beruclean series top the highest of demands placed on efficient cleaning systems for technical equipment and industrial floors in production halls. **Beruclean cleaning agents** make a compelling case by virtue of their high quality, optimized performance characteristics and excellent efficiency.

The Beruclean cleaning agents have been developed specifically for scrubber vacuum machines as well as high-pressure and steam jet tools, but they are also ideal for manual cleaning processes. Ingredient substances that are sparing on resources and a low-consumption formulation guarantee the maximum of efficiency and excellent cleaning results. With Beruclean Eco, BECHEM offers a multi purpose easily biodegradable and virtually odorless industrial cleaner that, thanks to its special cleaning effect and low surface tension, reliably removes oil and grease, oil carbon, wax, tar, and bitumen – plus it's non-corrosive.

Take advantage of the expertise and comprehensive technical services provided by BECHEM application engineers and get a one-on-one consultation focused on your production processes.

Adhesive lubricants

PRODUCT	Base oil	Thickener	NLGI-grade*	Kinematic viscosity [mm²/s] at 40 °C / 100 °C	Service temperature range [°C]		Description
Berulit EL 420 / Berugear HV RI	Mineral oil	Aluminum complex soap	0–00 000	490 32	-20	180	Running-in lubricant for open gears, excellent wear protection, good adhesion, very high load-carrying capacity, contains additives and solid lubricants, application by means of spray units and dip baths
Berulit GA 400 → 2500	Mineral oil, Mineral oil/ synthetic oil	Aluminum complex soap	0–00 0–00 00	490/32 1050/43 2500/100	-20 -10 5	180 180 200	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)
Berulit GA 800 → 2500 Fluid	Mineral oil	Aluminum complex soap	000*	1000/45 3175/113	-10 0	120 200	Operating lubricant for open gear drives, increased base oil viscosity, excellent wear protection, very high load-carrying capacity, strong adhesion, contains graphite, suitable for dip baths, sprayable
Berugear HV 3 → 20	Mineral oil/ synthetic oil	-	- - -	3300/190 10000/370 18500/550	0 0 10	120 120 140	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
Berugear UWS FG 34-00	Synthetic ester	Lithium-Calcium-Soap	00	320 40	-50	80	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

*Value refers to the unworked penetration

Lubricating oils

PRODUCT	Base oil	Kinematic Viscosity [mm²/s] at 40 °C		Viscosity index	Pourpoint [°C]	Flashpoint [°C]	Specification	Type	Description
BECHEM Staroil G 100 → 680	Mineral oil	100 to 680	95 to 100	-33 to -18	≥ 235 to ≥ 260		DIN 51517-3	CLP	High-performance gear oil for spur, bevel, planetary and worm gears, excellent wear protection, very high ageing resistance, good load-carrying capacity and viscosity/temperature behavior, excellent water and air separation capacity
BECHEM Staroil SMO 150 → 1500	Mineral oil	150 to 1350	90 to 95	-33 to -10	≥ 220 to ≥ 230		DIN 51517-3	CLPF	MoS_2-containing high-performance gear oil for heavy-duty gear units with high flank pressures and shock loads, good load-carrying capacity and excellent wear protection, very high ageing resistance, excellent water and air separation capacity
Berugear GS 68 BM → 680 BM	Mineral oil	68 to 738	92 to 100	-30 to -15	≥ 210 to ≥ 290		DIN 51517-3	CLPF, CLP	High-performance oil for heavy-duty gears, contains PD-additives, excellent wear protection, very high resistance to micropitting, forms reactive surface layer that supports plastic deformation and thus increases the contact area, highly effective on gears with high percentages of sliding friction
Berusynth EP 100 → 1000	Polyglycol	100 to 1000	203 to 278	-42 to -30	≥ 240 to ≥ 280		DIN 51517-3	CLP PG	High-performance gear oil on polyglycol basis for heavy-duty spur, bevel, planetary and worm gears, allows extended oil changing intervals, excellent wear protection, very high ageing resistance, reduces tooth friction losses in the gear unit
Berusynth GP 68 → 1000	Polyalphaolefin (PAO)	67 to 1007	155 to 165	-60 to -27	≥ 275 to ≥ 250		DIN 51517-3	CLP HC	High-performance gear oil on polyalphaolefin basis for heavy-duty spur, bevel, planetary and worm gear units, allows extended oil changing intervals, excellent wear protection, very high ageing resistance, miscible with mineral oil
Berusynth GPX 150 → 680	Polyalphaolefin (PAO)	150 to 680	177 to 197	-48 to -36	≥ 245 to ≥ 251		DIN 51517-3	CLP	High-performance polyalphaolefin-based gear oil for gears, rolling and plain bearings with exceptionally high viscosity index, very high micropitting resistance, excellent wear protection, for high pressure loads and shock loads

Special applications

PRODUCT	Base oil	Kinematic viscosity [mm²/s] at 40 °C	Pourpoint [°C]	Flashpoint [°C]	Type	Description
Berulub VPN 13 Ringlub	Synthetic oil	150	-20	≥ 300	ANPFE	High-temperature fluid, sprayable, excellent wear protection, very high ignition temperature, low smoke development on hot surfaces, e.g. for floating tires of rotary kilns
Beruprotect Rope Dressing	Mineral oil	10	-30	≥ 140	ANL 10	Wire rope lubricant, fluid, good creeping properties, excellent wear and corrosion protection, outstanding adhesion, excellent wetting properties
BECHEM High-Lub SW 2 V	Mineral oil	-	-	≥ 41	-	Corrosion protection grease dispersion with highly volatile solvent and dewatering additives for ropes and chains, for aggressive ambient conditions, extremely high level wear protection through EP additives, water-resistant, excellent corrosion protection, excellent pumpability
Berulit IKP	Mineral oil	115	-36	≥ 190	ANLPF 100	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
Berusynth CU 250	Ester	250	-45	≥ 250	ANELP 250	High-temperature chain oil, wide application temperature range, excellent wetting and creeping properties, hot and cold water resistant, good corrosion protection, no formation of critical residues, H2-registered

Recommended applications

PRODUCT	Central lubrication system in heavy open-cast mining equipment, normal temperature range	Central lubrication system in heavy open-cast mining equipment, low temperature range	Bucket chain bearings in heavy open-cast mining equipment	Slewing ring bearings in heavy open-cast mining equipment	Slewing gears in heavy open-cast mining equipment	Running-in lubricant open gear drives of mills, rotary kilns, drums	Service lubricant open gear drives of mills, rotary kilns, drums	Service lubricant open gear drives of palletizer disks	Bearings of pinions, support rollers, mill trunnions and pelletizing disks[1]	Bearings of pinions, support rollers, mill trunnions and pelletizing disks[2]	Main bearings of roller presses/grinding rollers of vertical roller mills[1]	Main bearings of roller presses/grinding rollers of vertical roller mills[2]	Joint bearings of vertical roller mills	Electric motor bearings	Main bearings of roller crushers and vibrating screens	Main bearings of cone and gyratory crushers	Main bearings of ladles and converters	Main bearings of water pumps and washing systems	Tensioning rollers of conveyor systems	Castors of conveyor systems	Main bearings of separators and fans	Sealing grease for sintering furnaces	Wheel bearings of sinter wagons and sinter belts	Floating tires of rotary kilns and coolers	Chains in dusty environments	Chains in wet and chemically aggressive environments	Chains in the high temperature range	Wire ropes in dusty environments	Wire ropes in wet and chemically aggressive environments
Berulit EL 420/ Berugear HV RI						•																							
Berulit GA 400 → 2500 LV					•		•	•																				•	
Berugear HV 3 → HV 20							•	•																					
BECHEM High-Lub LT series	•																		•										
BECHEM High-Lub LM series		•																	•										
BECHEM High-Lub LFB 2000	•								•				•		•			•			•								
BECHEM High-Lub FA 67-2														•															
BECHEM High-Lub FA 67-400 KS	•			•					•				•		•		•	•	•		•								
BECHEM High-Lub FA 50 series				•							•		•		•		•												
BECHEM High-Lub SW 2																		•											
Beruplex CS 2 EP																		•			•	•							
Beruplex LI EP 2	•													•	•						•								
Beruplex PMC 40 F			•													•													
Beruplex PMC 42 F	•		•						•		•		•		•	•													
Berutox FE 18 EP														•							•								
Berutox FB 22														•							•								
Berutox M 21 KN														•							•	•	•						
Berutox FH 28 KN														•							•		•						
Berulub VPN 13 Ringlub																								•			•		
Beruprotect Rope Dressing																												•	
BECHEM High-Lub SW 2 V																										•			•
Berulit IKP																									•				
Berusynth CU 250																											•		
BECHEM Staroil G										•		•																	
Berusynth GP series										•		•																	
Berusynth EP series										•		•																	

[1] grease-lubricated [2] oil-lubricated

Lubrication solutions for industry

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