



**Special Lubricants for the
Cement Industry, Open Cast Mining
and Mineral Processing**



Under all conditions

In the cement industry, mining and mineral processing machines and equipment are often exposed to extreme working conditions. Besides environmental influences such as dust, humidity and sometimes high temperature variations, both very high and/or shock loads also have to be managed. Machine down time and possible production loss represent an enormous cost factor and since redundant systems are in general not available, the selected lubricant is of major importance.

Based on years of experience gathered in close cooperation with leading machine manufacturers special lubricants to cope with these severe conditions were developed in the BECHEM InnovationCenter.



Reduction of power losses, extension of life time

By the use of a new generation of high performance additives in the newly developed BECHEM lubricants a significant increase in wear protection combined with an extension of life time could be achieved.

With the application of these lubricants a reduction of power losses, lower maintenance costs and less down times are achievable. Thus requirements for a higher economic efficiency and higher equipment availability are fulfilled



Lubricating greases for roller and plain bearings

The very good wear and corrosion protection and the excellent mechanical stability of BECHEM greases allows the reliable mastering of high specific loads as well as influences of dust and moisture even at extended re-lubrication intervals.

By the use of newly developed high performance additives and their physical-chemical reactions with the metal surfaces the greases of the HIGH LUB FA series are additionally able to reduce friction and wear.

By using HIGH LUB FA 50 in slewing bearings of hydraulic excavators for instance a significant extension of bearing life time was achieved.

Some lubricating greases are additionally equipped with special combinations of solids for the use in bearings exposed to very high contact pressures and/or shock loads.

BECHEM greases proved their excellent performance in:

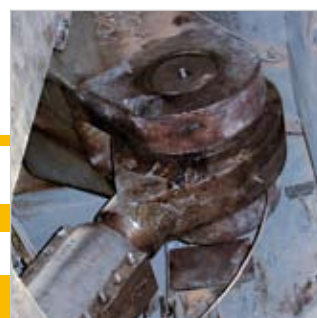
- main bearings of roller presses and crushers
- main and pivot bearings of vertical roller mills
- pinion and support roller bearings of mills and kilns
- pivot and slewing bearings of excavators
- main bearings of fans and blowers
- bearings of vibration screens and classifying systems
- idle and pulley rollers of conveyor systems

For thermally high loaded bearings in processing and reduction processes such as in

- clinker coolers and cooling chambers
- clinker and ore conveying systems
- ladles
- hot air fans

tailor made mineral oil and synthetic oil based high temperature greases of high thermal resistance are available.

The fully synthetic grease BERUTOX FH 28 KN e. g. achieves in the FAG FE 9 roller bearing test an approximately 7 times longer life time compared to conventional high temperature greases.



High performance oils for closed gear boxes and circulation systems

To comply with the increasing demand for a reduction of power losses and an extension of the oil life time BECHEM developed new mineral oil based and synthetic oil based high performance oils.

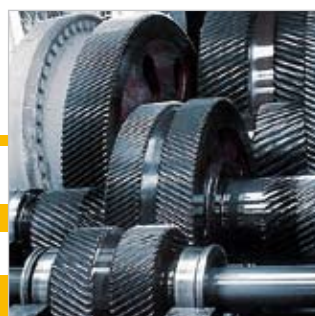
By using these oils in gear boxes and circulation systems of

- ball, rod and SAG mills
- rotary kilns, coolers and dryers
- vertical roller mills and roller presses
- hydraulic and bucket wheel excavators and draglines
- crushers and stacker and reclaimer systems
- cranes, winches, hoists and spreader systems
- conveyor systems

a reduction of lubricant related losses of 3–5 % in gear boxes as well as a reduction in oil sump temperatures can be achieved.

In gear boxes running with permanent temperatures above 90°C synthetic gear oils should be used. The oils of the BERUSYNTH EP and BERUSYNTH GP series offer, compared to mineral gear oils, an approximately 4 times longer life time. They additionally exceed the performance of conventional gear oils with respect to their load carrying capability.

With the BERUGEAR GS BM series products with an increased micro-pitting resistance based on a special high performance PD additive system are available. This system forms reactive layers of extremely high load carrying capability. Thus a micro flow process of surface roughness asperities and slight damages without any considerable material loss can take place at high specific flank pressures. Due to this micro flow process resulting in an increase in contact pattern the oils can also be used for running-in processes. The wetting and adhesion properties of the oils are improved by polar additives. The reaction layers formed on the surfaces reduce the coefficient of friction in the tooth contact and thus the power loss in the gear box.



Open gear lubricants

BECHEM open gear lubricants ensure a reliable wear protection with simultaneous low consumption by the use of special high performance additives.

With those lubricants open gear drives of

- ball, rod and SAG mills
- rotary kilns and coolers
- hydraulic and bucket wheel excavators and draglines
- crushers and stacker or reclaimer systems
- cranes, hoists, winches, drags and spreaders
- ladles and dryers

can reliably be lubricated.

For different requirements concerning temperature, influence of dust or moisture, re-lubrication intervals and lubricant application different product lines with and without solid lubricants can be offered. Approvals of renowned equipment manufacturers are available.

Technical service

When using our products BECHEM offers a complete range of technical service to all customers. This service can, depending on agreements, include the following points:

- regular technical inspections
- lubricant management and tribologic advice
- sampling and analysis of lubricant samples
- preparation of lubricating charts including the determination of control and failure factors
- carrying out of running-in processes
- support in repair work

A world wide net of technical service centres with well trained technicians is available for the technical service.



Lubricants for special applications

Loose tyres of rotary kilns

For the lubrication of the inner and side surfaces of loose tyres of rotary kilns a high temperature fluid equipped with a special solid lubricant combination is available. It does not catch fire on hot kiln surfaces and forms only very little smoke. After the evaporation of the synthetic carrier fluid it forms a resistant dry film which still gives effective protection against seizure and wear due to an excellent anchoring on the metal surfaces. The fluid can be applied by hand spray systems.

Wire ropes

Wire ropes of cranes, excavators, drags and conveyor systems have higher requirements with regard to reliable corrosion and wear protection. These requirements can be covered with BECHEM SEILSTAR or the products of the BERULIT GA series. The rope dressing BECHEM SEILSTAR was especially developed for dusty environment due to the formation of a semi-dry non sticky film.

Chains

A good wear and corrosion protection at round-steel link chains of large dimensions are achieved by adhesive semi-fluid greases like those of the BERULIT GA series or high viscous fluids. For small or middle sized conveyor chains with or without rollers, however, the penetration and wetting ability of the chain lubricant plays a significant role. Due to the fact that these chains are normally running in a very dusty environment the lubricant has to combine requirements of a high load carrying capability and a very good corrosion protection with dust repellence. The chain oils BERULIT IKP and BERUMOLY P 65 cover these requirements completely.



Lubricating greases

HIGH LUB FA 50 MO	Special grease of very high base oil viscosity with solids for bearings under extreme conditions typical applications: main bearings of roller presses, pivot bearings of vertical roller mills
HIGH LUB FA 40 MO	Special grease of high base oil viscosity with solids for heavily loaded bearings typical applications: heavy mining machinery, vibrating screens, main bearings of crushers
HIGH LUB FA 67	Special greases of different base oil viscosities without solids for heavily loaded bearings typical applications: conveyor systems, main bearings of fans and blowers
HIGH LUB LT 2 EP	Standard EP grease without solids for high loaded bearings, available in different NLGI grades
BERUPLEX CS 2 EP	Mineral oil based high temperature greases for general applications with high thermal loads
BERUPLEX KS 22	Mineral oil based high temperature greases thickened by an extreme stable special calcium complex soap, typical applications: clinker conveyor systems, roller bearings under the influence of water
BERUTOX FH 28 KN	Fully synthetic high temperature grease for continuous temperatures above 180°C

Gear oils

BERUSYNTH EP	Synthetic CLP PG gear oils based on polyglycol, available in ISO VG 68 to 1000
BERUSYNTH GP	Synthetic CLP HC gear oils based on synthetic hydrocarbon, available in ISO VG 68 to 1000
BERUGEAR GS BM	Special gear oils with PD additives for heavily loaded or damaged gears, available in ISO VG 100 to 1500
BECHEM STAROIL G	Standard mineral oil based CLP gear oils, available in ISO VG 68 to 1000

Open gear lubricants

BERULIT GA	Black coloured service lubricants based on an aluminium complex soap and graphite in a high concentration FZG-Test A/2,78/50 DIN 51354 p. 6 (draft) : damage load stage >12, specific wear < 0,2 mg/kWh
BERUGEAR HV	Light coloured solid free service lubricants of extreme high viscosity, very adhesive, for reduced lubricant consumption FZG-Test A/2,78/50 DIN 51354 p. 6 (draft) : damage load stage >12, specific wear < 0,2 mg/kWh

Special applications

BERULUB VPN 13 RINGLUB	Synthetic high temperature fluid with high solid content for the lubrication of loose tyres, service temp. -30° to 1150°C
BECHEM SEILSTAR	Light coloured anticorrosive agent for the conservation of all kinds of wire ropes, attracts dust hardly, water repellent
BERULIT IKP	Graphit containing EP chain oil of ISO VG 100 for dusty environment, successful at conveyor and loading systems
BERUMOLY P 65	MoS ₂ containing EP chain oil of ISO VG 5 for dusty environment, successful at bag filling systems

That'Special!

A tradition we are proud of since 1834. This is still today demonstrated by our trademark: the Rhus Flower. After permanent development BECHEM is today a »Global Player«.

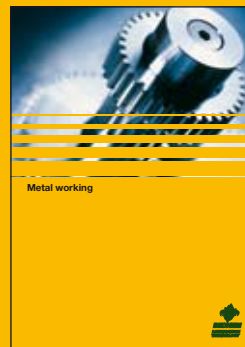
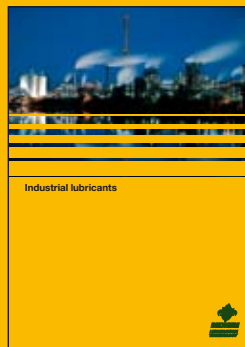
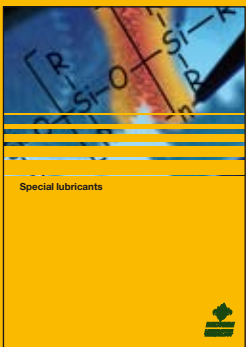
BECHEM special lubricants, industrial lubricants, metal working fluids and solutions for forming technology are based on our extensive experience in the development of special chemistry and latest tribologic knowledge. Our know-how with regard to friction, wear and lubrication always considers our customers' requirements for economic and ecologic optimisation of processes.

We feel obliged to tradition and progress. That'Special!

Besides the headquarter in Hagen, BECHEM has two more production sites in Germany, i.e. in Mieste and Kierspe. In addition to that, our worldwide distribution network allows us to develop markets all over the world. With the daughter companies in France, India, Switzerland and North East China, as well as the Joint Ventures in the USA, South Africa, Sweden, Russia and South China BECHEM shows its international presence.

It is our target to supply our customers with high quality products and to simultaneously meet the valid international standards. The quality of our products is confirmed by the certification according to the automotive standard ISO/TS 16949. The requirement to our standard is guaranteed by the systematically effected internal audits and regular inspections by the RWTÜV at all sites, as well as by audits carried out by our customers.

Further information material can be ordered directly with us or is available under www.bechem.com.



Special lubricants

- Low and high temperature lubricants
- Plastic lubrication
- Electrical contact lubricants
- Food grade lubricants
- Valve lubricants
- Anti-Friction-Coatings

Industrial lubricants

- High performance multipurpose greases
- Heavy duty and high temperature lubricants
- Hydraulic oils
- Gear lubricants
- Green lubricants

Metal working

- Deep drawing/punching oils
- Coolant lubricants
- Cutting and grinding oils
- Deep drilling oils
- Corrosion protection oils
- Cleaning agents

Forming technology

- Wire drawing lubricants
- Cold forging oils
- Semi hot/hot forging
- Tube drawing lubricants
- Cold massive forming oils



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