



Special lubricants  
for the iron and steel industry



**BECHEM**  
LUBRICATION  
TECHNOLOGY



# Special lubricants for the iron and steel industry

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 
- Hydraulic 
- Chains 

### PROPERTIES

- High loads 
- High temperatures 
- Low temperatures 
- Resistant to water 
- Good pumpability 
- Corrosion protection 

# Lubricants for the steel industry

The demand for lubricants used is also increasing with the requirements for the technical equipment in the steel industry. The targeted use of BECHEM high performance lubricants can reduce costs, protect the environment and maximize machine life.

The steel making process is characterized by difficult tribological framework conditions, such as process temperatures, corrosive coolants, abrasive dusts or large shock loads. BECHEM lubricants offer sophisticated solutions for a trouble-free production process. They make a great contribution to protecting surfaces from tribocorrosion and to minimizing foreign particle entry.

BECHEM has developed lubricants with outstanding water and temperature resistance as well as exceptional corrosion protection for high performance operation in the steel industry. Many products are the result of intensive research cooperation with leading steel producers in which renowned machine and system manufacturers as well as companies from drive technology were involved.

BECHEM products contribute considerably to the avoidance of production downtimes that are associated with high costs, and to extending the technical service life of equipment.

» BECHEM high performance lubricants master tribological challenges. «



# Iron making

## Sintering plant

The conveyors transport the moist sinter from the mixing drum to the sintering plant where the sinter mix is baked and crushed. Individual grate cars form the sintering belt, which has to withstand the effects of heat and dust. In order to ensure optimal function under these conditions, the recommended lubricant for the bearings of the grate car is **Berutox FH 28 KN**, for the slide rails **Beruplex CS 2 EP** and **Berutox M 21 KN**, and **BECHEM High-Lub FA 50 MO** for the heavy duty bearings. BECHEM lubrication greases for high loads offer an excellent wear protection as well as very good water resistance and EP properties.

## Coke oven

Coke is produced from coal in the coke ovens at temperatures of 1200 to 1400 °C. The hot coke is pressed into the quenching car in a pressing process. The lubrication of the rack of the compression machine with **Berulit GA** series products ensures a reliable wear protection and an extension of the service life. Coke oven gas fittings are preferably lubricated with **Beruplex CS 2 F** in order to achieve absolute sealing ability.

## Blast furnace

The oven is supplied with coke and batched at the upper end of the shaft of the blast furnace, the furnace top, and the furnace gases are deflected. The throat stopper as well as all conveyors are lubricated with highly effective semi-fluid greases. They are suitable for heavily loaded roller bearings, toothed and worm gears and are characterized by excellent water resistance and corrosion protection.

## Direct reduction / hot briquetting

For the central supply of the lubrication points of a direct reduction system, the **BECHEM High-Lub LT 2 EP** is suitable due to its good transportability and versatile lubricating properties. The **BECHEM High-Lub FA** series is used to lubricate hot screens and other peripheral units. In hot conveyors, lubricants of the **Beruplex** series guarantee flawless functionality. **BECHEM High-Lub FA 50 MO** is used to lubricate the main bearings of compactors. The interplay of thickeners, base oil and solid lubricants gives the lubricant excellent properties for this application, which lead to a significant extension of the service life duration in operating systems. BECHEM also has optimized briquette separators to improve the briquette quality and the operational reliability.



The hot briquetting represents a modern alternative to the blast furnace process.



» BECHEM offers many lubricant solutions for direct reduction. «

# Steelworks and continuous casting line

The operating conditions in a continuous casting line are defined by low speeds, high thermal stress and corrosive process water ingress. For system-critical applications in steelworks, such as the ladle turret, strand guiding rollers or converter bearings, BECHEM special lubricants were developed with various qualities, which, for example, differ through the addition of solid lubricant particles or the base oil viscosity.

Central lubricants for the bearings of guide rollers represent a tribologically demanding challenge. Conflicting challenges are to be met here, such as the good transportability in central lubrication systems with a simultaneously high base oil viscosity for lubricating bearings at slow speeds. In addition, the requirements in the continuous casting lines of the steelworks differ from each other considerably. For this broad range of applications, BECHEM offers a variety of proven lubrication

greases, such as **Berutox M 21 KN**, **Berutemp M 21 HT**, **BECHEM Ceritol PSA 12 H**, **BECHEM High-Lub LT 2 EP**, **Beruplex CS 2 EP**, **Beruplex Alutherm 2** or **Beruplex HTA**. Synthetic oils are best suited for oil-air lubrication systems.

The flame-retardant and water-miscible **BECHEM Starlit EM-MA-DF** is used in the hydraulic system of the electric arc furnace. The side bearings of the converter, which represent a particularly sensitive lubrication point, are supplied with the heavy load lubrication greases **BECHEM High-Lub FA 40 MO** and **BECHEM High-Lub FA 50 MO**. For efficient lubrication, **BECHEM High-Lub FA 50 MO** for the bearings of the ladle turret and **Berulit GA** series for the open drives are proven products.

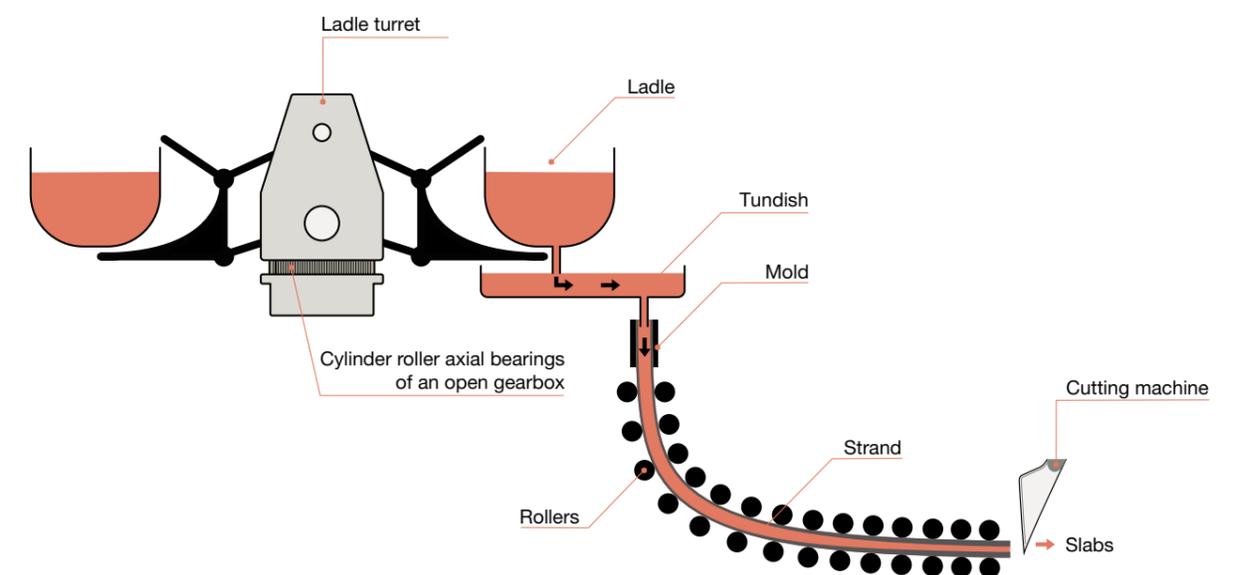


Berutox M 21 KN has proven itself worldwide in the continuous casting line.



The heavy duty bearings are lubricated with BECHEM High-Lub FA 40 MO or BECHEM High-Lub FA 50 MO and thus provide for a flawless functioning of the sensitive application.

## Continuous casting line



# Rolling plants

Occasionally, higher speeds and shock loads occur in hot strip, cold strip, heavy plate and section mills. For the hot rolling process, the lubrication must have a good resistance to high temperatures and process water. In the cold rolling mill, the product must also be resistant to a chemically active rolling mill emulsion. Thanks to the good wear protection and excellent sealing and corrosion protection, tailor-made BECHEM lubricants optimize the performance and operating time of the system.

**BECHEM High-Lub FA 67-400** was developed together with the German steel industry, bearing manufacturers and universities for the challenging applications in work roller bearings of rolling mills. The product version **BECHEM High-Lub FA 67-400 KS** is used in bearings for an operating period of one year without relubrication. For roughing stands and slab up-setting presses, **BECHEM High-Lub FA 50** is successfully in use around the world. The central lubrication of the mill roller tables and peripheral system parts occurs due to the **BECHEM High-Lub LT 2 EP** or **Beruplex CS 2 EP**, since these products have a good transportability and versatile lubrication properties. **BECHEM Ceritol PSA 12 H** has proven itself for the special requirements of the reeling machine.

In cold rolling mills, the systems are run at significantly higher speeds. The requirements for the lubricant are very demanding in order to ensure that the system runs flawlessly. Since a chemically active roller emulsion is used

in many cases, chemical resistance and high sealing performance are of crucial importance. The immediate risk of overheating exists due to the increased hydrodynamic losses from higher operating speeds. The viscosity and composition of the lubricant must therefore be adapted in terms of the temperature increase and the minimization of the premature lubrication degradation.

The supporting roller bearings are lubricated with **BECHEM Ovitol KT 460 S**. Despite the water ingress, the oil provides hydrodynamic lubrication. It quickly separates from the water and the oil film is not affected. To lubricate the oil flow bearing of the supporting roller, BECHEM offers a unique system in which the high performance circulating oil is matched to the process water in each roller mill and is adjusted for each reappointment. This exclusive technology was developed in cooperation with major steel producers and a leading plant engineering company.

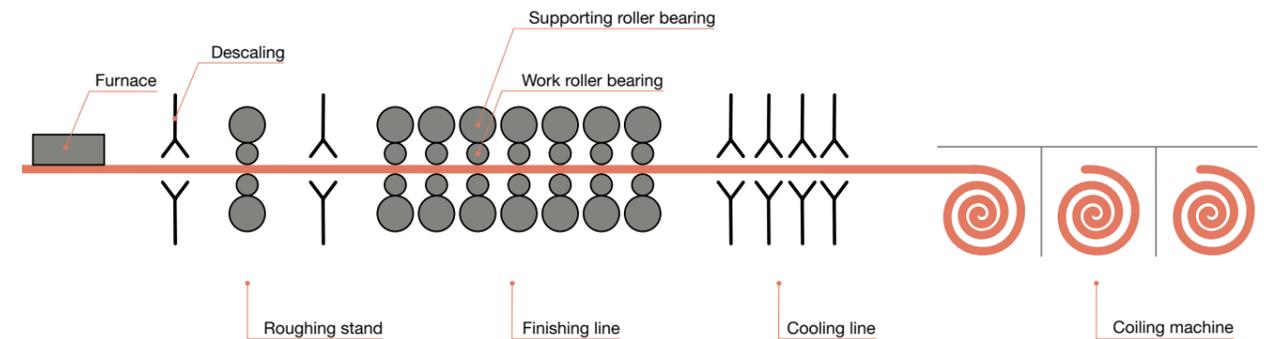
Extensive tests with international partners have shown that BECHEM lubricants make a significant contribution to the economic efficiency of the systems. BECHEM lubricants can also be effectively used for the rollers made for aluminum and copper forming.



BECHEM High-Lub FA 67-400 KS impresses with its good water resistance and the outstanding corrosion protection.



## Hot strip mill



# Lubricants for all applications

Many different operations of a metallurgical plant are marked by complex production processes that pose a variety of technical lubrication tasks. BECHEM offers an extensive lubrication range for these conditional. In addition to lubrication greases for general and special applications, it also includes hydraulic fluids, cooling lubricants, corrosion protection media, cable lubricants and chain oils.

Mineral oil basic and synthetic lubricating oils are available for gears and oil circulation. The mineral-based oils of the **BECHEM Staroil G** series cover many applications reliably. Synthetic oils are recommended in the case of special conditions, such as elevated temperatures, larger loads, previously damaged drives or longer oil change intervals. Here the poly-alpha-olefins of the **Berusynth HC** series or the polyglycols of the **Berusynth EP** series have stood the test worldwide.

|                     |   | PRODUCT                                       |                        |                    |   |                  |                                |  | Applications   | Properties |
|---------------------|---|---|------------------------|--------------------|---|------------------|--------------------------------|--|--|------------|
|                     |   | Base oil                                      | Thickener              | NLGI-grade         | Base Oil Viscosity (mm <sup>2</sup> /s) at 40 °C / 100 °C |                  | Service temperature range [°C] |  |  |            |
| Lubrication greases | <b>BECHEM High-Lub LT 2 EP</b><br>🔧🔧🔧🔧      | Mineral oil                                   | Lithium soap           | 2                  | 180<br>15   | -20              | +140                           | Central lubrication, continuous casting guide roller bearing, mill roller tables, direct reduction plants                            | EP-grease with extended service temperature range, excellent water resistance, excellent protection against corrosion, excellent pumpability in central lubrication systems  |            |
|                     | <b>BECHEM High-Lub FA 67-400 KS</b><br>🔧🔧🔧🔧 | Mineral oil                                   | Lithium-/ Calcium soap | 2                  | 400<br>30   | -20              | +140                           | Working roll bearings from hot and cold rolling mills, crushers, screens, pinion bearings  | For long-life lubrication, good sealing qualities, excellent water resistance, outstanding protection against corrosion, good pumpability in central lubrication systems, EP-properties  |            |
|                     | <b>BECHEM High-Lub FA 50</b><br>🔧🔧🔧🔧        | Mineral oil                                   | Lithium-/ Calcium soap | 2                  | 920<br>42   | -20              | +120                           | Heavy duty bearings, slab upsetting presses, roughing stands   | Long-life lubrication for high to very high loads, excellent water resistance, excellent protection against corrosion, contains high-viscous mineral base oil and EP-additives   |            |
|                     | <b>BECHEM High-Lub FA 40 MO</b><br>🔧🔧🔧🔧     | Mineral oil                                   | Lithium-/ Calcium soap | 2                  | 400<br>30   | -20              | +120                           | Heavy duty bearings, converter bearings, crushers, screens, pinion bearings  | For long-life lubrication, good sealing qualities, excellent water resistance and pumpability, excellent protection against corrosion, high load-carrying capacity, with solid lubricants and EP-additives                                       |            |
|                     | <b>BECHEM High-Lub FA 50 MO</b><br>🔧🔧🔧🔧     | Mineral oil                                   | Lithium-/ Calcium soap | 2                  | 1200<br>47  | -20              | +120                           | Heavy duty bearings, converter bearings, main bearings of briquette presses Bearings of briquette presses                            | Long-life lubrication for high to very high loads, excellent water resistance, excellent protection against corrosion, high-viscous mineral oil, contains solid lubricants and EP-additives  |            |
|                     | <b>Beruplex CS 2 EP</b><br>🔧🔧🔧🔧             | Mineral oil                                   | Calcium complex soap   | 2                  | 150<br>13   | -25              | +140                           | Central lubrication, continuous casting roller bearings, mill roller tables, slide rails of sinter machines                          | EP-grease, extremely wide temperature range, excellent water resistance, excellent protection against corrosion, excellent pumpability in central lubrication systems, high load carrying capacity   |            |
|                     | <b>Beruplex HTA</b><br>🔧🔧🔧🔧                 | Mineral oil                                   | Aluminium complex soap | 2                  | 230<br>15   | -25              | +190<br>+200                   | Central lubrication, continuous casting guide roller bearings, cooling beds, mill roller tables, cleaning device for electric filter | Multipurpose grease with an extraordinarily wide temperature range, good protection against corrosion, excellent pumpability in central lubrication systems even in case of strong thermal radiation   |            |
|                     | <b>Berutemp M 21 KN</b><br>🔧🔧🔧🔧             | Mineral oil                                   | Polyurea               | 1-2                | 490<br>32   | -20              | +180                           | Central lubrication, continuous casting guide roller bearings, hot roller tables   | Long-life lubricating grease, excellent consistency-temperature-behaviour, excellent resistance to water, excellent corrosion and wear protection, EP-properties   |            |
|                     | <b>Berutemp M 21 HT</b><br>🔧🔧🔧🔧             | Mineral oil                                   | Polyurea               | 1-2                | 490<br>32   | -20              | +180                           | Central lubrication, continuous casting guide roller bearings, hot roller tables   | Long-life lubricating grease, outstanding consistency-temperature behavior even at overheating, excellent resistance to water and corrosion and wear protection, fluid on the lubricating lines even in case of thermal radiation, EP-properties |            |
|                     | <b>BECHEM Ceritol PSA 12 H</b><br>🔧🔧🔧🔧      | Mineral oil                                   | Special Polyurea       | 1-2                | 240<br>17   | -20              | +160                           | Central lubrication, continuous casting guide roller bearings, cooling beds, coiling machines, hot roller tables                     | High-temperature grease, no pipe clogging in central lubrication systems even in case of thermal radiation, excellent sealing qualities, good corrosion and wear protection  |            |
| Adhesive lubricants | <b>Berutemp FH 28 KN</b><br>🔧🔧🔧🔧            | Polyalpha-olefin (PAO)                        | Polyurea               | 1-2                | 400<br>40   | -30              | +180<br>+200                   | Central lubrication, continuous casting guide roller bearings, grate car bearings in the sintering plant                             | Fully synthetic long-life lubricating grease, excellent consistency-temperature-behaviour, excellent resistance to water, excellent corrosion and wear protection, EP-properties, NSF-H2 certified   |            |
|                     | <b>Berulit GA 400 → 2500</b><br>🔧🔧🔧🔧        | Mineral oil,<br>Mineral oil/<br>Synthetic oil | Aluminium complex soap | 0-00<br>0-00<br>00 | 490/32<br>1050/43<br>2500/100                             | -20<br>-10<br>+5 | +180<br>+180<br>+200           | Open drives, rack and guide of the pusher ram, steel cables  | Service lubricant for open gear drives, good wear protection, good adhesion, very high load carrying capacity, contains graphite, preferably applied by spray units (2500)   |            |
|                     | <b>Berulit GA 800 → 2500 Fluid</b><br>🔧🔧🔧🔧  | Mineral oil,<br>Mineral oil/<br>Synthetic oil | Aluminium complex soap | 000*<br>000*       | 1000/45<br>3175/113                                       | -10<br>0         | +120<br>+250                   | Open drives  | Service lubricant for open gear drives, increased base oil viscosity, excellent wear protection, very high load carrying capacity, adhesive, contains graphite, suitable for dip baths or circulating systems, sprayable                         |            |

|                      |  | PRODUCT                |   |                  |                  |                 |                            |                  | Applications  | Properties   |
|----------------------|--|------------------------|---|------------------|------------------|-----------------|----------------------------|------------------|---|--|
|                      |  | Base oil               | Viscosity (mm <sup>2</sup> /s) at 40 °C |                  | Viscosity index  | Pour point [°C] | Flash point [°C]           | Specification    |   |  |
| Lubrication oils     | <b>BECHEM Staroil G 100 → 680</b><br>🔧🔧🔧🔧    | Mineral oil            | 100<br>to<br>680                        | 95<br>to<br>100  | -33<br>to<br>-18 | ≥ 230           | DIN 51517-3                | CLP              | Gears and oil circulation lubricants, oil-air lubrication   | High-performance gear oils for spur, bevel, planetary and worm gears, excellent wear protection, very high ageing resistance, good load carrying capacity and viscosity-temperature-behaviour, excellent water and air separation capacity |
|                      | <b>Berusynth HC 15 → 1000</b><br>🔧🔧🔧🔧        | Polyalpha-olefin (PAO) | 15<br>to<br>1000                        | 125<br>to<br>165 | -65<br>to<br>-35 | ≥ 170           | DIN 51517-3                | CLP HC<br>HLP HC | Gears and oil circulation lubricants, oil-air lubrication   | High-performance gear oils on polyalphaolefin basis for heavy-duty spur, bevel, planetary and worm gears, allows extended oil changing intervals, excellent wear protection, high ageing resistance, miscible with mineral oil             |
|                      | <b>Berusynth EP 68 → 1000</b><br>🔧🔧🔧🔧        | Polyglycol             | 68<br>to<br>1000                        | 196<br>to<br>278 | -42<br>to<br>-30 | ≥ 240           | DIN 51517-3                | CLP PG           | Gears and oil circulation lubricants, oil-air lubrication   | High-performance gear oils on polyglycol basis, for heavy-duty spur, bevel, planetary and worm gears for extended oil changing intervals, excellent wear protection, very high ageing resistance, reduces friction loss in the gear        |
| Special applications | <b>BECHEM Ovitrol KT 100 → 460 S</b><br>🔧🔧🔧🔧 | Mineral oil            | 100<br>to<br>460                        | 94               | -15<br>to<br>-9  | ≥ 220           | DIN 51502,<br>DIN ISO 3448 | CL               | Oil circulation for slide bearings, especially for supporting rollers of hot and cold strip mills | Machine and circulating oils for flood lubricated bearings in rolling mills, excellent water separation capacity and corrosion protection, very good resistance to ageing  |
|                      | <b>BECHEM Starlit EM-MA-DF</b><br>🔧🔧🔧🔧       | -                      | -                                       | -                | -                | -               | -                          | HFA-S            | Hydraulic systems of electric arc furnaces and in other high fire risk areas                      | Fire-resistant, water miscible hydraulic concentrate for face support, good protection against corrosion, best biostability, good filtration properties  |



All information and values correspond to the current state of knowledge and are only used for orientation.

# Technical service

BECHEM offers comprehensive technical service through a globally available team of highly qualified application engineers. This may include the following items according to the respective agreements:

- Technical inspections
- Lubricant management and consultation
- Sampling and analysis of lubricant samples
- Creation of lubrication charts determining the monitoring or failure criteria
- Custom development of lubricants

## Custom laboratory tests

The additives of the high-performance circulating oil **BECHEM Ovitol KT 460** are optimized for the water quality used in order to achieve the best water separation values.



The laboratory test shows the water separation capability of various lubricating oils after five minutes. To the left is the non-optimized, commercially available circulating oil with process water. In the middle is standard oil with process water and to the right is the BECHEM Ovitol KT 460 S optimized for the process water with an outstanding water separation value.

## Awarded

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

