Specialty lubricants for the iron and steel industry
BECHEM – Lubrication solutions for industry

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

BECHEM products are proven by innovative formulations in the most diverse of industrial applications – in machining and forming metal working processes, in coating technology and as for-life lubricants in various technical components.

A strong network of distributors and several national and international production sites ensure that BECHEM products are readily available worldwide.

Tomorrow’s technologies. Today.
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.
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.

»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, BECHEM Ceritol PSA 12 H, BECHEM High-Lub LT 2 EP, Beruplex CS 2 EP or Beruplex HTA. Synthetic oils are best suited for oil-air lubrication systems.

The flame-retardant and water-miscible BECHEM Starlit EM-BB-2 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.
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 upsetting 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.
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 conditions. 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.

<table>
<thead>
<tr>
<th>PRODUCT</th>
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<tbody>
<tr>
<td>BECHEM High-Lub LT 2 EP</td>
<td>Mineral oil</td>
<td>Central lubrication, continuous casting guide roller bearings, mill roller tables, direct reduction plants</td>
<td>EP-grease with extended service temperature range, excellent water resistance, excellent protection against corrosion, excellent pumpability in central lubrication systems</td>
</tr>
<tr>
<td>BECHEM High-Lub FA 67-400 KS</td>
<td>Mineral oil</td>
<td>Working rolling bearings from hot and cold rolling mills, crushers, screens, pinion bearings</td>
<td>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</td>
</tr>
<tr>
<td>BECHEM High-Lub FA 90</td>
<td>Mineral oil</td>
<td>Heavy duty bearings, slab upsetting presses, roughing stands</td>
<td>Long-life lubrication for high to very high loads, excellent water resistance, excellent protection against corrosion, contains high-viscous mineral oil, contains solid lubricants and EP-additives</td>
</tr>
<tr>
<td>Beruplex CS 2 EP</td>
<td>Mineral oil</td>
<td>Central lubrication, continuous casting guide roller bearings, mill roller tables, slide rails of sinter machines</td>
<td>EP-grease, extremely wide temperature range, excellent protection against corrosion, excellent protection against corrosion, excellent pumpability in central lubrication systems, high load carrying capacity</td>
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<tr>
<td>Beruplex CS 2 F</td>
<td>Mineral oil</td>
<td>Coke oven gas fittings</td>
<td>EP-grease, extremely wide temperature range, excellent protection against corrosion, excellent pumpability, excellent water resistance and adhesion, excellent sealing qualities</td>
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<td>Beruplex HTA</td>
<td>Mineral oil</td>
<td>Central lubrication, continuous casting guide roller bearings, cooling beds, mill roller tables, cooling device for electric filter</td>
<td>Long-life lubricating grease, excellent consistency-temperature-behaviour, excellent resistance to water, excellent corrosion and wear protection, EP-properties</td>
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<tr>
<td>Beruplex M 21 KN</td>
<td>Mineral oil</td>
<td>Central lubrication, continuous casting guide roller bearings, hot roller tables</td>
<td>High-temperature grease, no pipe clogging in central lubrication systems even in case of thermal radiation, excellent sealing qualities, good corrosion and wear protection</td>
</tr>
<tr>
<td>BECHEM Caritol PSA 12 H</td>
<td>Polyurea</td>
<td>Central lubrication, continuous casting guide roller bearings, cooling beds, cooling machines, hot roller tables</td>
<td>Fully synthetic long-life lubricating grease, excellent consistency-temperature-behaviour, excellent resistance to water, excellent corrosion and wear protection, EP-properties, NSF-H2 certified</td>
</tr>
<tr>
<td>Benuplex Ph 28 KN</td>
<td>Polyurea</td>
<td>Central lubrication, continuous casting guide roller bearings, grate car bearings in the sintering plant</td>
<td>Service lubricant for open gear drives, good wear protection, good adhesion, very high load carrying capacity, contains graphite, preferably applied by spray units</td>
</tr>
<tr>
<td>Berull GA 400 + 2500</td>
<td>Mineral oil</td>
<td>Open drives, rack and guide of the pusher ram, steel cables</td>
<td>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</td>
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<tr>
<td>Berull GA 400 + 2500 Fluid</td>
<td>Mineral oil</td>
<td>Open drives, rack and guide of the pusher ram, steel cables</td>
<td>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</td>
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<td>BECHEM Staroil G 100 + 880</td>
<td>Mineral oil</td>
<td>Gears and oil circulation lubricants, oil-air lubrication</td>
<td>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</td>
</tr>
<tr>
<td>Berusynth HC 10 + 1000</td>
<td>Polyalpha-olefin (PAO)</td>
<td>Gears and oil circulation lubricants, oil-air lubrication</td>
<td>High-performance gear oils on polyalphaolefin basis for heavy-duty spur, bevel, planetary and worm gears, allows extended oiling intervals, excellent wear protection, high ageing resistance, miscible with mineral oil</td>
</tr>
<tr>
<td>Berusynth EP 68 + 1000</td>
<td>Polyurea</td>
<td>Gears and oil circulation lubricants, oil-air lubrication</td>
<td>High-performance gear oils on polyurea basis, for heavy-duty spur, bevel, planetary and worm gears for extended oiling intervals, excellent wear protection, very high ageing resistance, reduces friction loss in the gear</td>
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<tr>
<td>BECHEM Ovitol KT 100 + 880 S</td>
<td>Polyurea</td>
<td>Oil circulation for slid bearings, especially for supporting roller of hot and cold strip mills</td>
<td>Machine and circulating oils for flood lubricated bearings in rolling mills, excellent water separation capacity and corrosion protection, very good resistance to ageing</td>
</tr>
<tr>
<td>BECHEM Staroil EM-BB-2</td>
<td>Polyurea</td>
<td>Hydraulic systems of electric arc furnaces and in other high fire risk areas</td>
<td>Fire-resistant, water miscible hydraulic concentrate for face support, good protection against corrosion, best biostability, good filtration properties</td>
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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.

BECHEM was awarded a prize for tailor-made solutions for vehicles in the premium segment.

As an award winner, BECHEM now belongs to the 20 most innovative companies in North Rhine-Westphalia.

BECHEM received an award for innovative lifetime lubrication of various vehicle components.

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

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.
Lubrication Solutions for Industry