Special Lubricants and Noise Damping for the Automotive Industry
Knowing the Requirements

There are various requirements in the automotive industry. With each new generation of automobiles come enormous innovations regarding comfort, security and environmental compatibility. Technically optimised motors always achieve better performance. Moreover, the construction details of modern vehicles are getting more and more complex because of the electrical and electronic components.

The permanent pressure to keep costs down and make savings in weight requires the selection of new materials and smaller system components with improved quality and functional reliability. BECHEM’s strategy is to offer automobile customers a global partnership in the field of lubricant development and to ensure production tailored to the latest requirements. That’s special.

Practical Development

The testing machines used by BECHEM can simulate real conditions, such as vibrational strain and unfavourable environmental conditions, and this makes a substantial contribution to shorter development cycles for our customers in the automotive industry. By means of these test procedures we develop intelligent lubricants, which are more resistant to high and low temperatures, to heavy loads, to climatic conditions, substances, and which offer a longer service life. Our quality management system guarantees that the properties of the BECHEM lubricants meet customer requirements.
Material Compatibility and Noise Damping

Aside from the wide range of applications, it is the compatibility of our lubricants with plastics and elastomers that is one of the most innovative solutions in automotive technology. In order to find the most suitable lubricant for the various elastomers, numerous tests are required, e.g. with regard to swelling, tensile strength, elongation, compression strain and shore hardness A and D. As construction elements, the BECHEM lubricants tested comply with the above requirements and have proved very successful in components of the automotive industry. In addition, our products offer improved haptic feedback, and a specially selected product system (Noise Damping Lubricants) avoids undesirable noise in the vehicle, today one of the most important quality features.

Tailored to Application

An important advantage of our R&D is the testing of model switches, original construction parts and original materials. This saves our partners in the automotive industry considerable time for their own developmental work. In the mechatronic field, the requirements for contact reliability, material compatibility and durability under different climatic conditions are extremely high. Model switches offer the possibility of easily determining measurable variables other than in serial contact arrangements.

The importance of simulating practical test conditions is demonstrated by the successful development of our special lubricants for drive shafts. By means of our modern CV-joint test bench we are in a position to optimise our products with regard to reducing friction, increasing efficiency and durability, and reducing noise.

The same applies to drive and brake systems, variable and drive motors, where we develop tribologic solutions in close cooperation with our clients’ R&D departments.
Special lubricants for automotive systems and system components

- Noise Damping Lubricants
- Plastic Lubrication
- Electrical Contact Greases
- Chassis Lubrication
- Special Components

- **Door and window seals**
  - BERULUB® ND-DISPERSIONS
  - BERULUB® ND-FLUIDS
  - BERUCOAT FX-SERIES (AF COATINGS)

- **Door trim**
  - BECHEM VPG 34
  - BERUCOAT AK-SERIES (AF COATINGS)

- **Window regulator**
  - BECHEM-RHUS LH 2
  - BERULUB® FR 16
  - BERULUB® XP-SERIES

- **Steering column**
  - BERULUB® FR 16
  - BERULUB® FB 48/1

- **Dual-mass flywheels**
  - BERUSIL FO 42

- **Motor management**
  - BERULUB® FZ 1 E 3

- **Belt tensioning systems**
  - BERUSIL FO 36-2

- **Headlight control device**
  - BERULUB® FR 66

- **CV joints**
  - BECHEM-HTBJ
  - BERULUB® GGF 1001

- **Brake cylinder**
  - BERULUB® FE 16

- **Ashtrey/cup holder**
  - BERUSOFT-SERIES
  - BERULUB® FR 16
  - BERULUB® FR 43

- **Air flaps**
  - BERULUB® ND-DISPERSIONS

- **Sunroofs**
  - BERULUB® FR 16
  - BERULUB® FR 43
  - BERUSOFT-SERIES
  - BECHEM VPG 34
**electrical contacts**
- BERULUB® FK 30
- BERULUB® FK 35 B
- BERULUB® FK 97 E
- BERULUB® FK 122
- BERUTOX® VPT 64 DISPERSIONS
- BERULUB® KRYOTOX EL 2

**seat adjustment**
- BERULUB® FR 16
- BERULUB® FR 43
- BERULUB® XP 719
- BERULUB® XP 2400

**seat adjustment with memory function**
- BERULUB® FR 16
- BERULUB® FR 43
- BERULUB® FR 16
- BERUSIL FO 22 F

**headrests, sun visors, sunroofs, jalousies, cup holder**
- BERULUB® FR 16
- BERUSIL FO 22 F
- BERULUB® FR 43

**seat systems**
- BERUTOX® VPT 64-2
- BERULUB® XP 3000

**supporting and guide elements**
- BERULUB® FW 3

**locking systems/central locking systems**
- BERULUB® FR 16 (B)
- BERULUB® FB 48/1
- BERULUB® XP 746
- BERULUB® ND-FLUIDS
- BERUCOAT AF-SERIES (AF COATINGS)

**mirror adjustment**
- BERULUB® FR 16
- BERULUB® FR 43
- BERUSOFT-SERIES

**belt systems**
- BERULUB® XP-SERIES

**seat recliner, seat adjustment**
- BERULUB® FR 16
- BERULUB® FR 43
- BERULUB® XP 719

**seat runner**
- BERULUB® XP SERIES

**panels**
- BERULUB® ND-FLUIDS
- BERUTOX® VPT 64-2
- BERULUB® ND-DISPERSIONS
- BERUSOFT-SERIES
- BERUCOAT AK-SERIES (AF COATINGS)

**multifunction steering-wheel/flat cables**
- CERITOL PK 1
- CERITOL PK 1 SOFT
- BERUTOX® M 21 EPK-A
- BERULUB® XP 719
- BERULUB® XP 2400

**headbrake cable**
- BERULUB® FR 43
- BERUTOX® VPT 64-2
- BERULUB® XP-746

**HVAC units**
- BERULUB® FR 16
- BERULUB® FR 43
- BERULUB® ND-FLUIDS
- BERUSOFT-SERIES

**gear shift mechanism**
- BERULUB® 52142
- BERULUB® FR 16
- BERUSIL FO 22 F

**supporting and guide elements**
- BERULUB® FW 3

**panels**
- BERULUB® ND-FLUIDS
- BERUTOX® VPT 64-2
- BERULUB® ND-DISPERSIONS
- BERUSOFT-SERIES
- BERUCOAT AK-SERIES (AF COATINGS)
### Plastic Lubricants

<table>
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<th>Product</th>
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<th>References/Approvals</th>
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</thead>
<tbody>
<tr>
<td>BERULUB® FR 16 (B)</td>
<td>locking systems</td>
<td>Independently of the challenges BECHEM is facing, we are always eager to develop</td>
<td>VW/AUDI/Škoda/Seat TL 778 A/TL 778 B</td>
</tr>
<tr>
<td>BERULUB® FR 43</td>
<td>sunroofs</td>
<td>new lubricants for individual requirements. These specially developed lubricants</td>
<td>Ford</td>
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<td></td>
<td>step motors</td>
<td>for material pairings metal/plastics or plastics/plastics have proved successful</td>
<td>WSD M1C 234 A2</td>
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<td></td>
<td>linear motors</td>
<td>all over the world under all climatic conditions. One example for the automotive</td>
<td>WSD M1C 160 D2</td>
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<td>wiper motors</td>
<td>industry is the lubricant tailored to use with flat cables in multifunctional</td>
<td>Opel</td>
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<td>interior systems</td>
<td>steering wheels.</td>
<td>B 040 0858/B 040 1135</td>
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<tr>
<td>BERULUB® FH 57</td>
<td>jalousies</td>
<td></td>
<td>B 040 0084/B 040 0571</td>
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<td></td>
<td>interior systems</td>
<td></td>
<td>B 040 1132</td>
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<tr>
<td>BERULUB® FB 48/1</td>
<td>locking systems</td>
<td></td>
<td>BMW Group</td>
</tr>
<tr>
<td>CERITOL PK 1 SOFT</td>
<td>clockspring</td>
<td></td>
<td>N 60058.0 Part 3</td>
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<td>BERUSIL FO 22 F</td>
<td>gear shift mechanism</td>
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<td>PSA Group</td>
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<td>Bowden cables</td>
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<td>Push-Pull cables</td>
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<td>9986248</td>
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<td>Daimler Chrysler</td>
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<td>Brose</td>
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<td></td>
<td>002-63501-4 Gruppe 3</td>
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<td>563501-110 Gruppe 53</td>
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<td>563501 Gruppe 55</td>
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<td>Kostal</td>
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<td>Kiekert AG</td>
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<td>Valeo</td>
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<td>Delphi Automotive</td>
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### Noise Damping Lubricants

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BERULUB® ND-DISPERSIONS</td>
<td>interior systems</td>
<td>In view of the increasing demand for comfort, the question of noise damping</td>
<td>Ford</td>
</tr>
<tr>
<td>BERULUB® ND-FLUID 160</td>
<td>HVAC units</td>
<td>(avoidance of impact sound) is of the utmost importance for the automotive</td>
<td>WSS M1C 253 A</td>
</tr>
<tr>
<td></td>
<td>leather components</td>
<td>and supplier industry. Minimisation of rattling and squeaking noises inside</td>
<td>WSS M1C 253 A2</td>
</tr>
<tr>
<td>BERUTOX® VPT 64-2</td>
<td>interior systems</td>
<td>the vehicle caused by vibration is our top target. BECHEM has developed a</td>
<td>Jaguar</td>
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<td></td>
<td>seat systems</td>
<td>complete product range of special lubricants that decisively contribute to</td>
<td>BMW Group</td>
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<td></td>
<td>door modules</td>
<td>noise damping inside the vehicle and thus considerably enhance the driving</td>
<td>VW/AUDI/Škoda/Seat TL 52141</td>
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<tr>
<td>BERUSOFT 15/20/30</td>
<td>interior systems</td>
<td>experience.</td>
<td>Delphi Automotive</td>
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<td>door modules</td>
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<td>Johnson Controls Inc.</td>
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<td></td>
<td>switches</td>
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<td>Lear Corporation</td>
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<td>BERULUB® XP 746</td>
<td>interior/exterior systems</td>
<td></td>
<td>Visteon Corporation</td>
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<td>BERULUB® XP 719</td>
<td>locking systems</td>
<td></td>
<td>Intier Automotive</td>
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<tr>
<td>BERULUB® XP 3000</td>
<td>window systems</td>
<td></td>
<td>Faurecia</td>
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<td>door modules</td>
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<td>Edscha AG</td>
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<td>pairings/metal/</td>
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<td>Fico Cables</td>
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<td>metal components</td>
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<td>SAIA-Burgess</td>
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<td>TRW</td>
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<td>KSR Automotive</td>
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<td>Fischer Automotive</td>
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<td>Brose</td>
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<td>563501-109</td>
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## Electrical Contact Greases

<table>
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<tr>
<th>Product</th>
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</thead>
<tbody>
<tr>
<td>BERULUB® FK 30</td>
<td>steering-column switch</td>
<td>The functionality, security and durability of electrical contact systems are governed by the lubricant. Contact materials, plastics, environmental influences and the lubricant must be considered together and be compatible with each other. BECHEM electrical contact lubricants offer tailor-made solutions for switches with different currents, from 0.1 mA up to 35 A.</td>
<td>Opel B 040 0084</td>
</tr>
<tr>
<td>BERULUB® FK 35 B</td>
<td>steering-column jacket module light switch</td>
<td></td>
<td>Brose 002-63501-4, Kostal, Valeo, Delphi Automotive, TRW, Bosch, HELAG, SAIA-Burgess, Siber, Busch-Jaeger</td>
</tr>
<tr>
<td>BERULUB® FK 97 E BERULUB® FK 122</td>
<td>mirror adjustment switch steering-column jacket module micro switch</td>
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<tr>
<td>BERUTOX® VPT 64 DISPERSIONS</td>
<td>micro switch printed circuit board</td>
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<tr>
<td>BERULUB® FK 64</td>
<td>various switches with PC</td>
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<tr>
<td>BERULUB®</td>
<td>ignition switch plug connector</td>
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<td>KRYOTOX EL 2</td>
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## Chassis Lubrication

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<tr>
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<tbody>
<tr>
<td>BERULUB® FW 3</td>
<td>supporting and guiding CV joints</td>
<td>BECHEM lubricants meet the requirements for supporting, guiding and CV joints; lifetime lubrication, compatibility with plastics, low friction values at oscillating movements, slight increase in adjustment moments at low temperatures, protection against corrosion and tribocorrosion.</td>
<td>VW/AUDI/Škoda/Seat TL 778/TL 52133 PSA Group S 71.3100 Opel B 040 1137 Lemförder 000 060 034055 Ind. C Bosch VS 18340-F1 Muhr und Bender AZ 000 725 Edscha AG 59385</td>
</tr>
<tr>
<td>BERULUB® GGF 1001</td>
<td>CV joints grease for normal-temperature application</td>
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<tr>
<td>BECHEM HTBJ</td>
<td>high-temperature grease for CV joints</td>
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## Special Components

<table>
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<tr>
<th>Product</th>
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</thead>
<tbody>
<tr>
<td>BERUSIL FO 36-2</td>
<td>manual gear shifts belt tensioning systems</td>
<td>It is BECHEM’s strength to always react to the various and latest requirements in the automotive industry. Here it is of the utmost importance to be aware of construction details and conditions of application. Thus, we are in a position to always offer a special lubricant tailored to specific requirements.</td>
<td>Ford WSS M1C 238 A ESF M1C43 A2 VW/AUDI/Škoda/Seat TL 767 X TL 52142 Muhr und Bender Linde &amp; Wiemann</td>
</tr>
<tr>
<td>BERULUB® 52142</td>
<td>manual gear shifts parking brakes folding tops</td>
<td></td>
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<tr>
<td>BERUCOAT AF, AK, FX</td>
<td>anti-friction and anti-squeak coatings for locking systems, elastomer seals and interior components</td>
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<tr>
<td>BERUTOX® M 21 EPK (A)</td>
<td>check arms</td>
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</table>
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 on the latest tribologic knowledge. Our know-how with regard to friction, wear and lubrication always takes account of our customers’ requirements for economical and ecological optimisation. We feel obliged to tradition and progress. That‘Special!

Besides the headquarter in Hagen, BECHEM has two other production sites in Germany – in Mieste and Kierspe. In addition to that, our worldwide distribution network allows us to develop markets all over the world. With daughter companies in France, India, Switzerland and North East China, as well as 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 corresponding international standards. The quality of our products is confirmed by certification according to the automotive standard ISO/TS 16949. The requirement to our standard is guaranteed by regular internal audits and inspections by the RWTÜV at all sites, as well as by audits carried out by our customers.

Further information material is available either direct from us or at 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