



Special lubricants and noise damping products for the automotive industry



**BECHEM**  
LUBRICATION  
TECHNOLOGY



# Special lubricants and noise damping products for the automotive industry

## 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.**












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## APPLICATIONS

- Roller bearings 
- Plain bearings 
- Thread lubrication 
- Electrical contacts 

## PROPERTIES

- High temperatures 
- Low temperatures 
- High loads 
- High speed 
- Good pumpability 
- Resistant to water 
- Noise damping 
- UV tracer 
- Compatible with plastics 
- Corrosion protection 
- Available in aerosols 

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



# Special lubricants for automotive systems and system components

- Legend:**
- Noise Damping
  - Plastic Lubrication
  - Electrical Contact Lubrication
  - Chassis Lubrication
  - Special Components

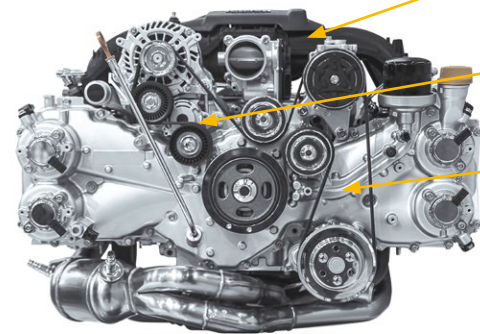
- Sunroofs**
- Berulub FR 16
  - Berulub FR 43
  - Beruplex LG 21 F
  - Beruplex LG 1-30
  - Berusoft-Series

- Door trim**
- Berucoat AK-Series (Anti Friction-Coatings)

- Headrests, sun visors, jalousies, cup holder**
- Berulub FR 16
  - Berulub FR 43
  - Berulub HFO 1

- Seat systems**
- Berutox VPT 64-2
  - Berulub XP 3000

- Power lift gates**
- Berulub FR 16



- Motor management**
- Berulub FZ 1 E 3

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

- Piston**
- Berucoat AF 291

- Electric parking brake, handbrake cable**
- Berulub FR 16
  - Beruplex LO 21
  - Berulub FR 43
  - Berutox VPT 64-2
  - Berulub XP 746

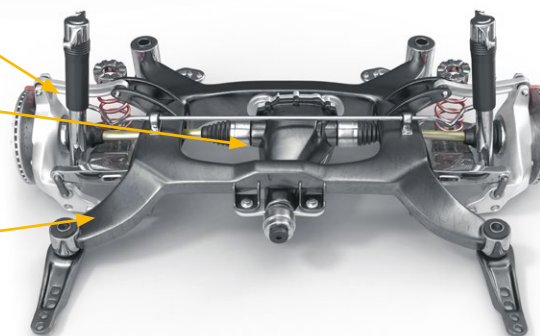
- Window regulator**
- BECHEM High-Lub LH 2
  - Berulub FR 16
  - Berulub FR 32-21
  - Berulub XP-Series

- Panels**
- Berucoat AK-Series (Anti Friction-Coatings)
  - Berulub ND-Fluids
  - Berutox VPT 64-2
  - Berulub ND-Dispersions
  - Berusoft-Series

- Braking systems**
- Berulub FE 16
  - Beruplex LG 21 F

- CV joints**
- BECHEM GKN HTBJ
  - Berulub CVH 170
  - Berulub CVN 140

- Ball joints**
- Berulub FW 700
  - Berulub SSG 46



- Cup holder, ashtray**
- Berusoft-Series
  - Berulub FR 16
  - Berulub FR 43

- Mirror adjustment**
- Berusoft-Series
  - Berulub FR 16
  - Berulub FR 43

- Multifunction steering, clock spring**
- BECHEM Ceritol PK 1 Soft
  - Berulub FR 82

- Steering column**
- Berulub FR 43
  - Berulub FR 32-21
  - Berutox FB 48-1
  - Beruglide L

- HVAC units**
- Berulub FR 16
  - Berulub FR 43
  - Berulub ND-Fluids
  - Berusoft-Series
  - Berusil TS 1

- Head-up Display**
- Berulub FK 164-2 UV
  - Beruglide H 50

- Electrical contacts**
- Berulub FK 35 B
  - Berulub FK 97 E
  - Berulub FK 122 UV
  - Berulub KR-EL 2
  - Berulub FK VPT 380
  - Berulub FK 164-2 UV
  - Berutox VPT 64-Dispersions

- Gear shift mechanism**
- Berulub 52142
  - Berulub FR 16
  - Berusil FO 22 F

- Headlight control device**
- Berulub FR 66
  - Berulub FK 164-2 UV

- Air flaps**
- Berulub ND-Dispersions
  - Berusil TS 1

- Check arm**
- BECHEM Ceritol PK 1
  - Berutox M 21 EPK-A
  - Berulub XP 719
  - Berusoft 15

- Door and window seals**
- Berulub ND-Dispersions
  - Berulub ND-Fluids
  - Berucoat FX-Series (Anti Friction-Coatings)

- Locking systems, central locking systems**
- Berulub FR 16 B
  - Berutox FB 48-1
  - Berulub XP 746
  - Berulub ND-Fluids
  - Berucoat AF-Series (Anti Friction-Coatings)

- Seat adjustment with memory function**
- Berulub FR 16
  - Berulub FH 57
  - Berulub FR 32-21
  - Berulub FR 150-21
  - Berulub FK 97 E

- Seat runner**
- Berulub XP-Series

- Seat recliner, seat adjustment**
- Berulub FR 16
  - Berulub FR 43
  - Berulub FH 57
  - Berulub FR 150-21
  - Berulub XP 719

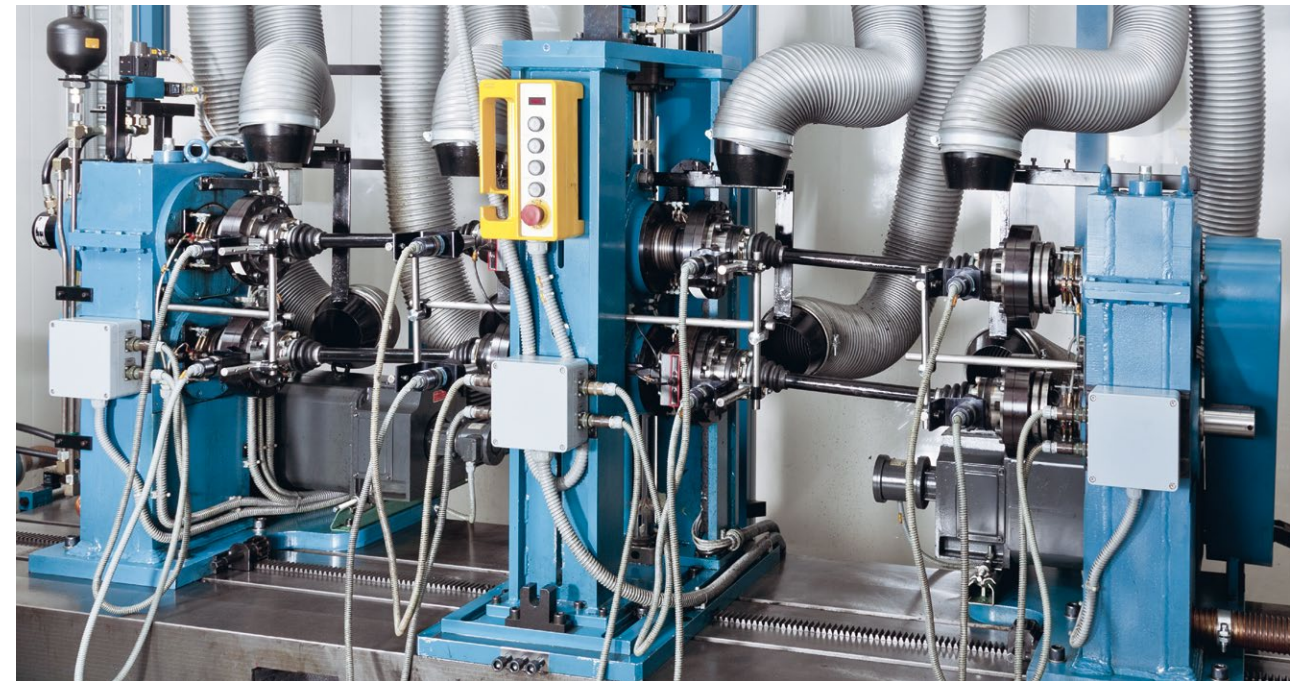
- Belt systems**
- Berulub XP-Series



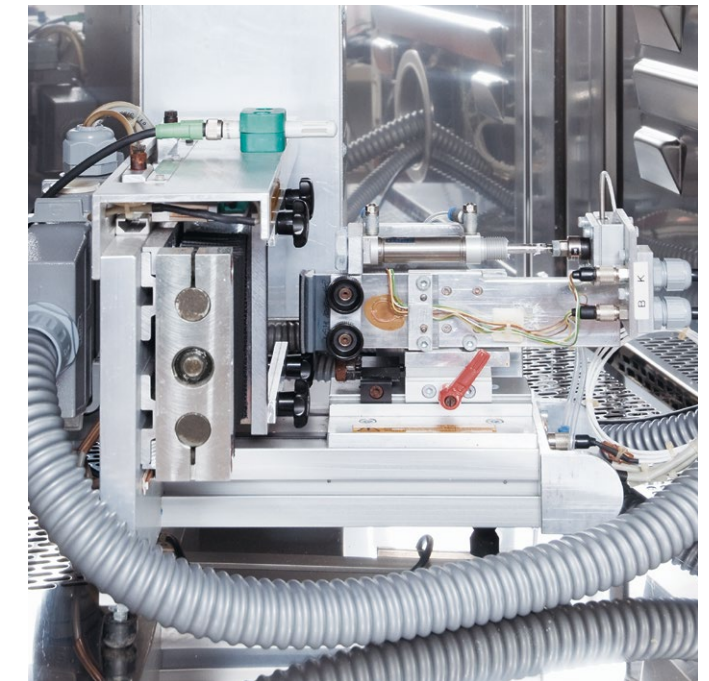
# Development partner for the automotive industry

The essential basis for innovative automotive lubricants is intense research and development work as well as modern testing equipment. In BECHEM's laboratories the latest physicochemical testing and analytical systems are available to characterise lubricants, control their application, analyse customer-specific problems and finally to develop the appropriate lubricant solutions. The testing of lubricants on model systems, original components and materials and the simulation of different vehicle-related conditions in the BECHEM laboratories help shorten product development times for our customers.

In cooperation with our customers and partners various test systems have been developed in research projects over the past few years. Involving our customers in the development of lubricants is also an essential part of our future problem solving.



Constant velocity joint test rig



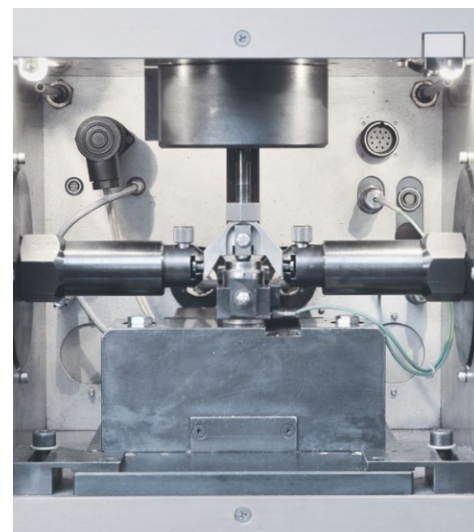
Stick-Slip test rig in climate chamber

Effective partners support us and thus our customers in the development of cross-system concepts. In addition to cooperating with universities and academies, BECHEM has excellent contacts with industry partners in the dosing and feeding technology, measurement and control technology, process and coating technology.

BECHEM's strategy is to offer automobile customers a global partnership in the fields of lubricant development and production to ensure that these are always tailored to the latest requirements.

»» What drives the automotive industry is change and development. ««

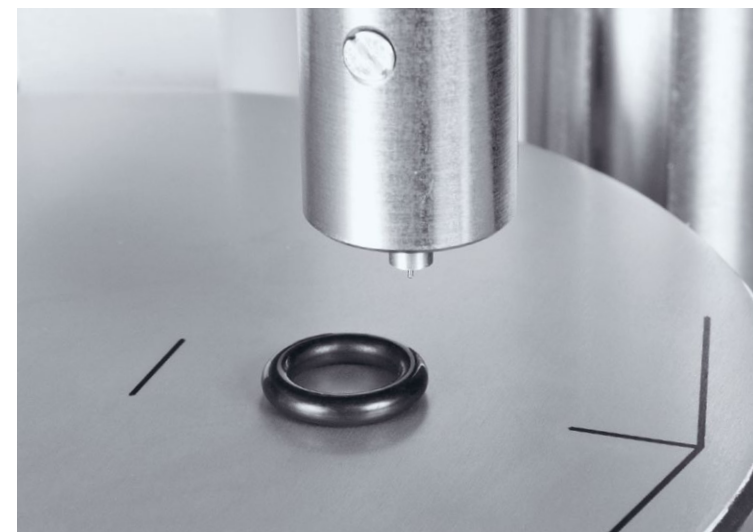
Translatory oscillation test rig (SRV)



Torque test rig



Hardness test of polymer materials



## Lubrication solutions for demanding requirements

- Reduction of friction and wear
- Durability and functional reliability
- Material compatibility
- Noise reduction
- Environmental compatibility
- Wide service temperature range
- Corrosion protection



# Interior components



With targeted vibration damping and optimisation of friction values, BECHEM lubricants allow controlled reproducible movements in all interior components such as cup holders, arm rests, door trims, consoles, control and switching systems. BECHEM products therefore make a major contribution to the functionality and haptics of interior components and upgrade the relevant parts and vehicles. Products, which are specifically designed for noise reduction, significantly improve driving comfort.

## Approvals / references

(in alphabetical order)

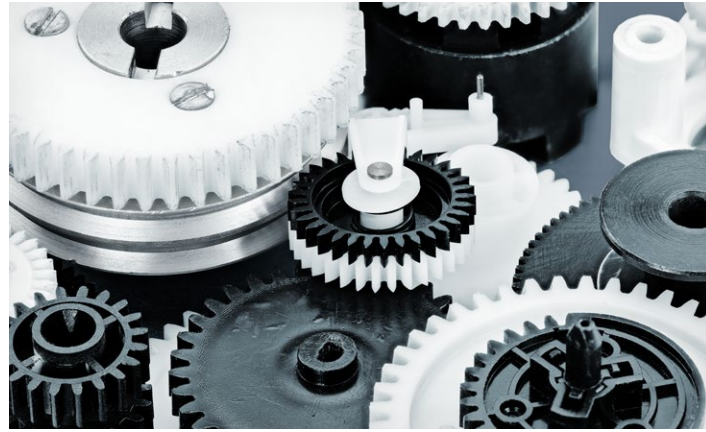
- Brose group 53.2
- Brose group 53.4
- Brose group 55.1
- Daimler DBL 6827.42
- Fiat Specification 9.55580 Gras V
- Ford WSD-M1C 234 A2
- GM W16531-Type 4
- GM W16531-Type 5
- GM 9986248
- VW-TL 778 A
- VW-TL 778 B
- VW-TL 52150

	PRODUCT		NLGI-grade	Base oil viscosity [mm <sup>2</sup> /s] at 40 °C / 100 °C		Applications	Noise damping	Description	
	Base oil / base	Thickener							
Lubricating Greases/Pastes	<b>Berulub FR 16</b>	Polyalpha-olefin (PAO)	Special lithium soap	2	32 / 6	-50 / +140	Cup holder, ash-tray, kinematic components, sun-shades	●○○	Suitable for the material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE
	<b>Berulub FR 43</b>	Polyalpha-olefin (PAO)	Special lithium soap	2	32 / 6	-50 / +140	HVAC, glove box compartment, center console, window runner	●●○	Suitable for material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE, available with UV tracer
	<b>Berulub FR 32-21</b>	Polyalpha-olefin (PAO)	Special lithium soap	1 - 2	32 / 6	-50 / +140	HVAC regulation, small and shift gears, sunroofs, push-pull cables, steering column adjustment	●●○	For long-term lubrication of the material combinations metal/polymer, excellent low-temperature behavior, prevents stick-slip, resistant to water and oxidation, very good noise damping properties, good EP properties
	<b>Berulub FR 150-21</b>	Polyalpha-olefin (PAO)	Special lithium soap	1 - 2	150 / 20	-50 / +140	HVAC regulation, seat adjustments, window regulators, grid and guide rails of electrical switches	●●○	For long-term lubrication of the material combinations metal/polymer, prevents stick-slip, excellent low-temperature behavior, resistant to water and oxidation, very good noise damping properties, good EP properties
	<b>Berulub FH 57</b>	Polyalpha-olefin (PAO)	Polyurea	1 - 2*	150 / 20	-40 / +160	Air condition console, gear shift mechanism	●●○	Fully synthetic grease for long-life lubrication of polymer components, excellent noise damping properties, excellent low temperature behaviour, contains PTFE
	<b>Berusoft 15</b>	Polyalpha-olefin (PAO)	Polyurea	1 - 2	900 / 100	-40 / +150	Climate control, glove box, arm rest, GPS controller	●●●	Synthetic special grease for noise damping, good plastic and elastomer compatibility, good oxidation resistance, minimal oil separation, prevents stick-slip, also available with UV-tracer
	<b>Berulub XP 3000</b>	Polyalpha-olefin (PAO)	Gel	1 - 2	2400 / 180	-40 / +140	Center arm rest, arm rest closure, gear selection cover, folding table	●●●	Good plastic and elastomer compatibility, high adhesion, good low temperature properties, very low oil separation, excellent protection against corrosion, excellent noise damping, UV tracer
	<b>Berulub FR 3000-21</b>	Polyalpha-olefin (PAO)	Special lithium soap	1 - 2	3400 / 300	-50 / +140	Controls, sun visors, steering column adjustment, window regulator, center console, arm rest	●●●	For the material combinations metal/polymer, maximum noise damping properties, prevents stick-slip, resistant to water and oxidation, high adhesion, very good low-temperature behavior, good EP properties
	<b>Beruplex LG 21 F</b>	Polyglykol	Lithium complex soap	1 - 2	390 / 66	-40 / +145	Sun roof, convertible roof top systems	●●○	Synthetic special lubricant for tribological pairings metal/elastomer, EPDM and plastic, temperature-stable/oxidation-stable, good adhesion, good corrosion protection, good EP properties, water-resistant
	<b>Beruglide L</b>	Perfluoropolyether (PFPE)	Polytetrafluoroethylene (PTFE)	1 - 2*	160 / 16	-40 / +190	Anti-squeak applications, convertible top gear	●●●	Fully synthetic special grease for plastic and polymer materials, excellent resistance to oxidation/aggressive media, good noise damping properties, contains PTFE
<b>Berusil TS 1</b>	Special silicone oil	Polytetrafluoroethylene (PTFE)	1 - 2*	3500 / 1500	-50 / +180	Flap mechanism for HVAC-Systems, kinematic construction parts	●●●	Noise damping silicone lubricant for long-life lubrication, good plastic and elastomer compatibility, wide temperature range, water resistant, prevents stick-slip	
Anti-friction coatings	<b>Berucoat AK 978</b>	Org. binder	-	-	-40 / +80	Anti-squeak applications, door modules, covers, arm rest closure	●●●	Water based interior AF-coating, prevents stick-slip and disturbing noises, highly compatible with plastics, transparent, free of formaldehyde, UV tracer	
	<b>Berucoat AK 376</b>	Org. binder	-	-	-40 / +120	Anti-squeak applications	●●●	Long-life lubrication for plastic and/or steel material combinations, no dust adsorption, prevents stick-slip, good protection against corrosion	
	<b>Berucoat AF 320 E</b>	Org. binder	-	-	-70 / +250	Sun visor, convertible top guide way, cigarette lighter	●○○	Suitable for plastic/steel combinations, long-life coating, prevents stick-slip, no dust adsorption, excellent protection against corrosion, oil resistant, curing temperature +120 °C	
Fluid	<b>Berulub ND-Fluid 160</b>	Perfluoropolyether (PFPE)	-	160 / 16	-40 / +200	Kinematic components, cup holder, air vents, anti-squeak applications	●○○	Noise damping fluid, excellent material compatibility (polymers, elastomers, non-ferrous metals, leather), high thermal stability and oxidation resistance, other viscosities are also available	

\*Value indicates unworked penetration ●○○ noise damping ●●○ good noise damping ●●● very good noise damping



# Mechatronic systems



BEICHEM provides a wide product range for a whole variety of manually and electrically operated actuators and control gears in the vehicle interior and body. These are characterised by their high wear resistance, excellent noise reduction properties and high functional reliability under the harshest climatic conditions worldwide. High levels of compatibility with various materials and the lowest starting torques at very low temperatures complete the range of benefits.

PRODUCT	Base oil	Thickener	NLGI-grade	Base oil viscosity (mm <sup>2</sup> /s) at 40 °C/ 100 °C		Service temperature range [°C]	Applications	Noise damping	Description
				32	6				
<b>Berulub FR 16</b> 	Polyalphaolefin (PAO)	Special lithium soap	2	32	-50	+140	Low torque, small gears, low noise damping	●○○	Suitable for the material combinations plastic/plastic and -/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE
<b>Berulub FR 43</b> 	Polyalphaolefin (PAO)	Special lithium soap	2	32	-50	+140	Low torque, medium noise damping	●●○	Suitable for material combinations plastic/plastic and -/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE, available with UV tracer
<b>Berulub FR 32-21</b> 	Polyalphaolefin (PAO)	Special lithium soap	1 - 2	32	-50	+140	Low torque, medium noise damping	●●○	For long-term lubrication of the material combinations metal/polymer, excellent low-temperature behavior, prevents stick-slip, resistant to water and oxidation, very good noise damping properties, good EP properties
<b>Berulub 10</b> 	Polyalphaolefin (PAO)	Special lithium soap	2	600	-40	+150	High torque, high noise damping	●●●	Special grease for noise damping, excellent compatibility with plastic and elastomers, good resistance to oxidation, low oil separation, prevents stick-slip, available with UV tracer
<b>Berulub FG-H 2 SL</b> 	Polyalphaolefin (PAO)	Special calcium complex soap	2	50	-45	+160 +200	Low torque, small gears	●○○	High-performance lubricant with good adhesion and sealing qualities, resistant to water and ageing, reliable protection against corrosion
<b>BEICHEM Ceritol PK 1 Soft</b> 	Polyalphaolefin (PAO)	Polyurea	0 - 1	32	-60	+140	Low torque, small gears, low noise damping	●○○	Special lubricant for metal and polymer materials, excellent low temperature behaviour, protection against corrosion, resistant to oxidation, contains EP-additives, prevents stick-slip, available with UV tracer
<b>Berulub FR 150-21</b> 	Polyalphaolefin (PAO)	Special lithium soap	1 - 2	150	-50	+140	Medium torque, medium noise damping	●●○	For long-term lubrication of the material combinations metal/polymer, prevents stick-slip, excellent low-temperature behavior, resistant to water and oxidation, very good noise damping properties, good EP properties
<b>Berulub FH 57</b> 	Polyalphaolefin (PAO)	Polyurea	1 - 2*	150	-40	+160	Medium torque, medium noise damping	●●○	Fully synthetic grease for long-life lubrication of polymer components, excellent noise damping properties, excellent low temperature behaviour, contains PTFE
<b>Beruglide H 50</b> 	Synthetic oil combination	Special lithium soap/PTFE	2	30	-60	+160	Low torque, small gears, high noise damping	●●●	Long-life lubrication for plastic/plastic, -/metal and non-ferrous metal/non-ferrous metal, excellent low temperature behaviour, noise damping, resistant to water, PTFE, UV tracer, hybrid technology
<b>Berulub FK 164-2 UV</b> 	Perfluoropolyether (PFPE)	Polytetrafluoroethylene (PTFE)	2	150	-60	+250	Low torque, small gears, high noise damping	●●●	Lubricating paste for gold and silver plated sliding/plug-in contacts, excellent plastics/elastomer compatibility, excellent low temperature behaviour
<b>Beruplex LO 10</b> 	Polyalphaolefin (PAO)	Lithium-complex soap	0 - 1	48	-50	+140	Low torque, small gears	●○○	Fully synthetic multipurpose grease for long-life lubrication of plastic/plastic, -/metal and steel/steel, excellent low-temperature behaviour, noise damping, resistant to oxidation and water, corrosion protection, available in NLGI-grade 1-2
<b>Berulub LHC 2 M</b> 	Polyalphaolefin (PAO)	Lithium soap	2	18	-50	+140	Low torque, small gears	●○○	For long-term lubrication of the material combinations metal/plastic, plastic/plastic and metal/non-ferrous metal, excellent low-temperature properties, prevents stick-slip, contains PTFE, also available in NLGI-grade 3

Lubricating Greases/Pastes

## Approvals/references

(in alphabetical order)

- Brose group 53.2
- Brose group 53.4
- Brose group 55.1
- Daimler DBL 6827.42
- Delphi Automotive
- Fiat Specification 9.55580 Gras V
- Ford WSD-M1C 234 A2
- GM 9986237, GM 9986248
- Kiekert AG
- Kostal
- Valeo
- VW-TL 778 A, VW-TL 778 B

\*Value indicates unworked penetration <sup>1)</sup>Value marked in grey indicates short term maximum temperature  
●○○ noise damping ●●○ good noise damping ●●● very good noise damping



# Electrical contacts



BEICHEM electrical contact lubrication products for the automotive industry meet the highest standards and make a major contribution to the functionality and durability of electrical contact systems with different currents due to their wide service temperature range. Highly specialised formulations guarantee excellent oxidation stability and material compatibility as well as protection against the formation of impurity layers and sparks.

	PRODUCT	PRODUCT					Applications	Description
		Base oil	Thickener	NLGI-grade	Base oil viscosity (mm <sup>2</sup> /s) at 40 °C/100 °C	Service temperature range [°C]		
Lubricating Greases/Pastes	<b>Berulub FK 125</b> 🔧 ⚙️ 🛠️ 🧴	Polyalpha-olefin (PAO)	Special lithium soap	1 - 2	20 4	-50 +120	Finger sliding systems, lubrication and protection of sliding contact systems	Lubrication and contact protection, improved electrical contact, contact protection against atmospheric influences, water resistant, UV tracer, very good low-temperature behaviour
	<b>Berulub FK 202</b> 🔧 ⚙️ 🛠️ 🧴	Polyalpha-olefin (PAO)	Lithium-calcium soap	2	18 4	-50 +120	Finger sliding systems, lubrication and protection of sliding contact systems	Lubrication and contact protection, improved electrical contact, contact protection against atmospheric influences, water resistant, UV tracer, very good low-temperature behaviour
	<b>Berulub KR-EL 2</b> 🔧 ⚙️ 🛠️ 🧴	Ester	Lithium soap	2	13 4	-50 +120	Ignition switch, electrical connector, wiper motor	Long-life lubricating grease and contact protection, forms a protective layer on copper/silver plated materials, excellent low temperature behaviour, prevents formation of impurity layers, available with UV tracer
	<b>Berulub FK 97 E</b> 🔧 ⚙️ 🛠️ 🧴	Ester	Polyurea	1*	78 12	-40 +150	Currents from 0,25 A to 15 A	Lubrication and protection against corrosion of lifting and sliding contacts, for materials of copper and silver
	<b>Berulub FK 122 UV</b> 🔧 ⚙️ 🛠️ 🧴	Ester	Polyurea	0*	78 11	-50 +150	Currents from 5 mA to 10 A	Lubrication and contact protection, improved contact making, neutral towards polymer materials, resistant to water, suitable for low temperatures
	<b>Berulub FK 164-2 UV</b> 🔧 ⚙️ 🛠️ 🧴	Perfluoropolyether (PFPE)	Polytetrafluoroethylene (PTFE)	2	150 45	-60 +250	Currents from 10 mA to 30 A	Lubricating paste for gold and silver plated sliding/plug-in contacts, excellent plastics/elastomer compatibility, excellent low temperature behaviour
Dispersions	<b>Berulub FK 164 Dispersion OZF 1-10</b> 🔧 ⚙️ 🛠️ 🧴	Perfluoropolyether (PFPE)	-	-	150	-60 +230	Currents from 1 mA to 500 mA	Contact protection, a very thin lubricating film with very low contact resistance is formed after evaporation of the solvent, suitable for contact partners of silver and gold
	<b>Berutox VPT 64 Dispersion OZF 0,5-20</b> 🔧 ⚙️ 🛠️ 🧴	Perfluoropolyether (PFPE)	-	-	325	-40 +250	Currents from 1 mA to 500 mA	Contact protection, a very thin lubricating film with very low contact resistance is formed after evaporation of the solvent, suitable for contact partners of silver and gold

\*Value indicates unworked penetration

» Electrical contacts require particularly high-performing lubricants. «

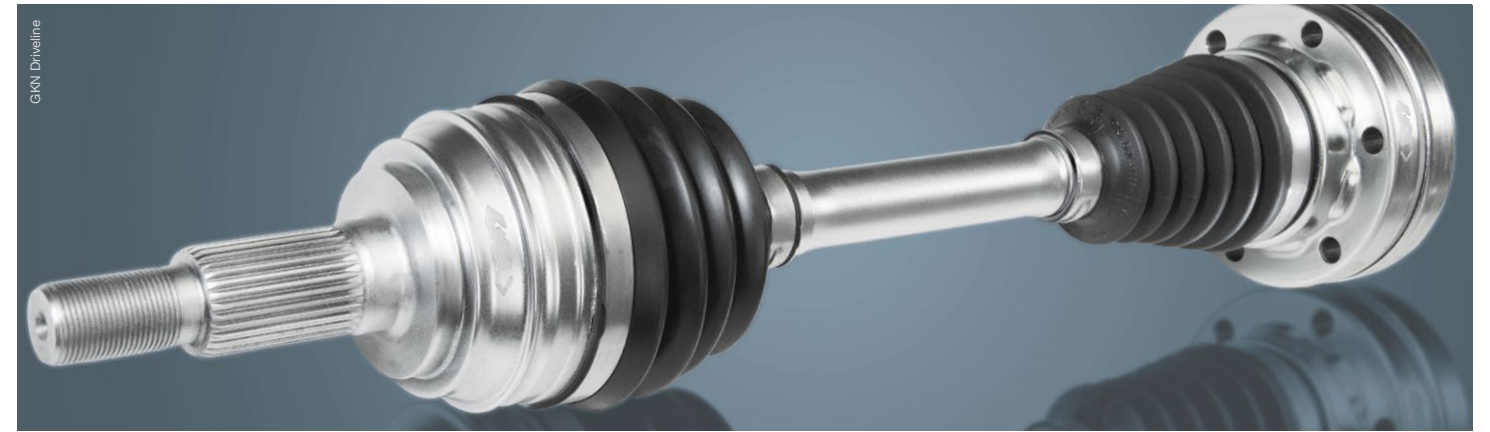
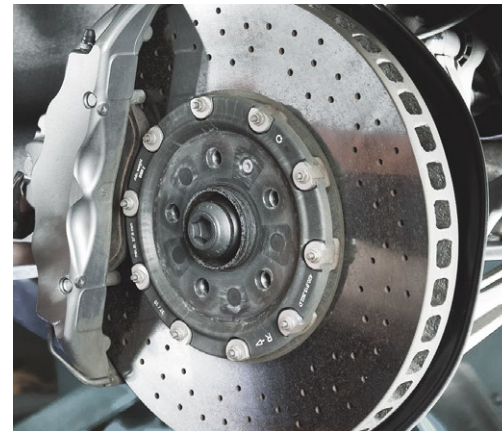
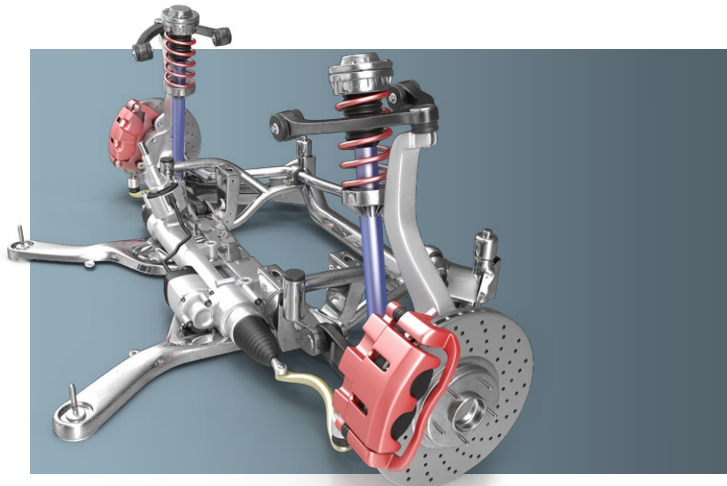
## Approvals/references

(in alphabetical order)

- Bosch
- BJA
- Delphi Automotive
- HELAG
- Kostal
- SAIA-Burgess
- Siber
- TRW
- Valeo



# Chassis and brake systems



With maximum material compatibility, corrosion protection, load-carrying capacity and protection against tribocorrosion, BECHEM products provide very high levels of reliability over the lifetime of the product for various systems and applications in chassis, brake and steering systems and for transmissions and clutches.

	PRODUCT		NLGI-grade	Base oil viscosity (mm <sup>2</sup> /s) at 40 °C / 100 °C		Service temperature range [°C]	Applications	Noise damping	Description
	Base oil / base	Thickener							
Lubricating Greases / Pastes	<b>Beruplex LI-EP 2</b>	Mineral oil	Lithium complex soap	2	180 16	-30 +150	Wheel bearing, drive shaft, clutch release bearing, brake cylinder	●○○	Long-life lubricating grease, reliable protection against corrosion, reduces wear at high temperatures, humidity and water steam, even under shock load
	<b>Berulub CVN 140</b>	Mineral oil	Lithium soap	1 - 2	140 13,5	-35 +130	CV-joint, components of the power train	●○○	Long-life lubricating grease for heavy-duty constant velocity joints, contains solid lubricants, optimal wear and corrosion protection
	<b>Berulub CVH 170</b>	Mineral oil/ Polyalpha-olefin (PAO)	Polyurea	1 - 2	170 14	-35 +160	CV-joint, components of the power train	●○○	Long-life grease for constant velocity joints, suitable for high temperatures, contains solid lubricants, excellent corrosion and wear protection
	<b>Berulub FE 16</b>	Polyglycol	Lithium soap	1 - 2	120 20	-40 +120	Elastomer seals, boots in hydraulic brake systems	●○○	Synthetic special lubricant for heavy-duty plain bearings, especially suitable for friction partners metal/plastics and metal/elastomer
	<b>Beruplex LG 21 F</b>	Polyglycol	Lithium complex soap	1 - 2	390 66	-40 +145	Clutch systems, elastic axle bearings, steering column gasket	●●○	Synthetic special lubricant for brake systems, wide temperature range, resistant to corrosion and oxidation, EP additives, good adhesion
	<b>Beruplex LG 1-30</b>	Polyglycol	Lithium complex soap	1 - 2	30 7	-50 +145	Electro-hydraulic actuators, electrical parking brake	●○○	For slide pairings metal/elastomer and metal/plastic, wide application temperature range, good adhesion, temperature-/corrosion-/oxidation-resistant, copper corrosion protection, contains PTFE and EP/AW additives
	<b>Berulub FR 16</b>	Polyalpha-olefin (PAO)	Special lithium soap	2	32 6	-50 +140	Electrical parking brake	●○○	Suitable for the material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE
	<b>Berulub FH 57</b>	Polyalpha-olefin (PAO)	Polyurea	1 - 2*	150 20	-40 +160	Steering column assembly	●●○	Fully synthetic grease for long-life lubrication of polymer components, excellent noise damping properties, excellent low temperature behaviour
	<b>Beruglide L</b>	Perfluoro-polyether (PFPE)	Polytetrafluoroethylene (PTFE)	1 - 2*	160 16	-40 +190	Steering column assembly	●●●	Fully synthetic special grease for plastic and polymer materials, excellent resistance to oxidation/aggressive media, good noise damping properties, contains PTFE
	<b>BECHEM Ceritol PK 1 Soft</b>	Polyalpha-olefin (PAO)	Polyurea	0 - 1	32 6	-60 +140	Clockspring cartridges, door closing mechanisms	●○○	Special lubricant for metal and polymer materials, excellent low temperature behaviour, protection against corrosion, resistant to oxidation, contains EP-additives, prevents stick-slip
Anti-friction coating	<b>Berucoat AF 320 E</b>	Organ. binder	-	-	-70 +250	Locking hooks, bolt connections, hinge pins, cams, notches, springs	●○○	Suitable for plastic/steel combinations, long-term coating, prevents stick-slip, no dust adsorption, excellent corrosion protection, oil resistant, curing temperature +120 °C	

\*Value indicates unworked penetration ●○○ noise damping ●●○ good noise damping ●●● very good noise damping

## Approvals / references

(in alphabetical order)

- Brose group 55.1
- Fiat Specification 9.55580 Gras V
- Ford WSD-M1C 234 A2
- GM 9986237
- GM 9986248
- VW-TL 52150
- VW-TL 778 A



# Seating and belt systems



For various applications in automotive seating and belt systems, whether actuators, cable winch systems or simple gear segments, with its excellent damping properties, wide service temperature range and good surface adhesion, the BECHEM product range offers maximum reliability even in emergency situations.

	PRODUCT		NLGI-grade	Base oil viscosity (mm <sup>2</sup> /s) at 40 °C/100 °C	Service temperature range [°C]	Applications	Noise damping	Description	
	Base oil /base	Thickener							
Lubricating Greases / Pastes	<b>Berutox VPT 54-2</b>	Perfluoropolyether (PFPE)	2	210 / 20	-30 / +230	Anti-squeak applications	•••	Long-life lubricating grease, resistant to thermal and chemical decomposition, excellent oxidation stability, excellent compatibility with plastics, also available in NLGI-grade 1	
	<b>Berulub FR 16</b>	Polyalphaolefin (PAO)	2	32 / 6	-50 / +140	Seat track, seat belt height adjustment	••	Suitable for the material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE	
	<b>Berulub FR 43</b>	Polyalphaolefin (PAO)	2	32 / 6	-50 / +140	Seat recliner, seat adjustment, seat height adjustment	•••	Suitable for material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE, available with UV tracer	
	<b>Berulub FR 32-21</b>	Polyalphaolefin (PAO)	Special lithium soap	1 - 2	32 / 6	-50 / +140	Seat recliner, seat adjustment, seat height adjustment	•••	For long-term lubrication of the material combinations metal/polymer, excellent low-temperature behavior, prevents stick-slip, resistant to water and oxidation, very good noise damping properties, good EP properties
	<b>Berusoft 15</b>	Polyalphaolefin (PAO)	Polyurea	1 - 2	900 / 100	-40 / +150	Seat recliner, seat adjustment	•••	Synthetic special grease for noise damping, good plastic and elastomer compatibility, good oxidation resistance, minimal oil separation, prevents stick-slip, also available with UV-tracer
	<b>Berulub FH 57</b>	Polyalphaolefin (PAO)	Polyurea	1 - 2*	150 / 20	-40 / +160	Seat recliner, easy entry, seat belt height adjustment, seat adjustment	•••	Fully synthetic grease for long-life lubrication of polymer components, excellent noise damping properties, excellent low temperature behaviour, contains PTFE
	<b>Berulub XP 746</b>	Ester	Gel	0	1200 / 120	-40 / +200	Seat recliner, seat track	•••	Noise damping grease, good adhesion, water and fuel resistant, low oil separation, good oxidation resistance and good protection against corrosion
	<b>Berulub XP 3000</b>	Polyalphaolefin (PAO)	Gel	1 - 2	2400 / 180	-40 / +140	Seat catch, seat track	•••	Good plastic and elastomer compatibility, high adhesion, very low oil separation, excellent protection against corrosion, noise damping, UV tracer
Disp.	<b>Berulub ND-Dispersion 10</b>	Perfluoropolyether (PFPE)	-	-	325 / 20	-40 / +250	Anti-squeak applications	••	For noise damping, excellent plastic/elastomer/non-ferrous metal compatibility, very high thermal stability, excellent resistance to oxidation
	Anti-friction coatings	<b>Berucoat AF 320 E</b>	Organ. binder	-	-	-70 / +250	Locking hooks, bolt connections, hinge pins, cams, notches, springs	•••	Suitable for plastic/steel combinations, prevents stick-slip, no dust adsorption, excellent protection against corrosion, oil resistant, curing temperature +120 °C
<b>Berucoat AF 732</b>		Organ. binder	-	-	-70 / +250	Ratchet notches, seat belt ratchet, pawls	•••	Suitable for metal/metal material combinations, long-life coating, very good adhesion, no sticking of dust, prevents stick-slip, excellent protection against corrosion, oil resistant	
<b>Berucoat AK 376</b>		Organ. binder	-	-	-40 / +120	Anti-squeak applications	•••	Long-life lubrication for plastic and/or steel material combinations, no dust adsorption, prevents stick-slip, good protection against corrosion	
<b>Berucoat AK 978</b>		Organ. binder	-	-	-40 / +80	Headrest adjustment, anti-squeak applications	•••	Water based interior AF-coating, prevents stick-slip and disturbing noises, highly compatible with plastics, transparent, free of formaldehyde, UV tracer	

\*Value indicates unworked penetration ••• very good noise damping ••• good noise damping •• noise damping •• Value indicates unworked penetration

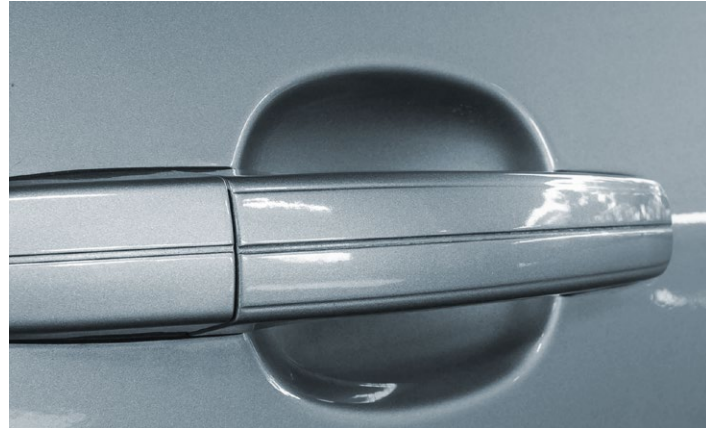
## Approvals / references

(in alphabetical order)

- Brose group 53.2
- Brose group 53.4
- Brose group 55.1
- Daimler DBL 6827.42
- Faurecia
- Fiat Spezifikation 9.55580 Gras V
- Ford WSD-M1C 234 A2, Ford WSS-M1C 253 A
- GM W16531-Type 4, GM W16531-Type 5, GM 9986248
- Johnson Controls
- Lear Corporation
- TRW
- VW-TL 778 A, VW-TL 778 B



# Locking systems and hinges



For increasingly complex door locking mechanisms and hinges BECHEM offers the appropriate lubricants and coating systems characterised by outstanding low-temperature properties, excellent water and deicing fluid resistance, paint compatibility and reliable corrosion protection.

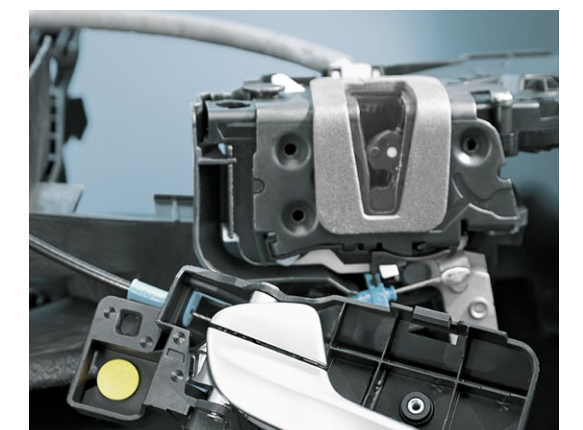
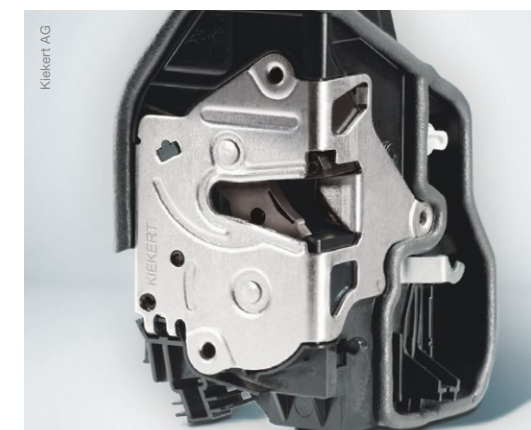
	PRODUCT		NLGI-grade	Base oil viscosity (mm <sup>2</sup> /s) at 40 °C/100 °C	Service temperature range (°C)	Applications	Noise damping	Description
	Base oil/base	Thickener						
Lubricating Greases/Pastes	<b>Berutox FB 48-1</b>	Polyalpha-olefin (PAO) Special Ca-complex soap	1	50/8	-50/+160	Door locking systems, central locking systems, steering lock, bowdies cables	○ ○ ○	For material combinations plastic/plastic and metal/plastic, resistant to substances, noise damping, resistant to ageing, low friction coefficient, prevents stick-slip
	<b>Berutox M 21 EPK-A</b>	Mineral oil Polyurea	1 - 2	490/32	-15/+160	Blocking pins, door check strap, hinges, gear shift control	● ● ○	Multipurpose grease for long-life lubrication, excellent sealing qualities, excellent resistance to water and steam, excellent corrosion and wear protection, EP-properties
	<b>Berulub FR 16 B</b>	Polyalpha-olefin (PAO) Lithium-/Ca-complex soap	2	32/6	-50/+140	Door locking systems, central locking systems	○ ○ ○	For material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip
	<b>Berulub FR 16</b>	Polyalpha-olefin (PAO) Special lithium soap	2	32/6	-50/+140	Door locking systems, central locking systems	● ○ ○	Suitable for the material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE
	<b>Berulub FR 43</b>	Polyalpha-olefin (PAO) Special lithium soap	2	32/6	-50/+140	Door locking systems, central locking systems	● ● ○	Suitable for material combinations plastic/plastic and plastic/metal, excellent low temperature behaviour, resistant to water and oxidation, prevents stick-slip, contains PTFE, available with UV tracer
	<b>Berulub FR 32-21</b>	Polyalpha-olefin (PAO) Special lithium soap	1 - 2	32/6	-50/+140	Door locking systems, central locking systems	● ● ○	For long-term lubrication of the material combinations metal/polymer, excellent low-temperature behavior, prevents stick-slip, resistant to water and oxidation, very good noise damping properties, good EP properties
	<b>BEICHEM Ceritol PK 1</b>	Polyalpha-olefin (PAO) Polyurea	1	50/8	-50/+160	Locking systems, central locking systems	● ○ ○	Long-life lubrication and protection against corrosion of roller/plain bearings, mechanisms and switchgear, wide temperature range, EP-additives, resistant to oxidation, protects against aggressive substances
	<b>Berulub XP 719</b>	Ester Gel	2*	1600/150	-40/+200	Locking systems, fuel flap, door handle	● ● ●	Excellent adhesion and resistance to wash-out, low oil separation, protection against corrosion, good oxidation resistance, reduces friction and wear
	<b>Berulub XP 746</b>	Ester Gel	0	1200/120	-40/+200	Locking systems, fuel flap, door handle	● ● ●	For noise damping in automotive application, good adhesion, water and fuel resistant, low oil separation, good oxidation resistance and good protection against corrosion
	<b>Berulub XP 3000</b>	Polyalpha-olefin (PAO) Gel	1 - 2	2400/180	-40/+140	Bonnet catch, locking systems	● ● ●	Good plastic and elastomer compatibility, high adhesion, good low temperature properties, very low oil separation, excellent protection against corrosion, noise damping, UV tracer
	<b>Berusoft 15</b>	Polyalpha-olefin (PAO) Polyurea	1 - 2	900/100	-40/+150	Door check strap, rear bench seat adjustment	● ● ●	Special grease for noise damping, excellent compatibility with elastomers, good resistance to oxidation, low oil separation, prevents stick-slip
	<b>Berusoft 20</b>	Polyalpha-olefin (PAO) Polyurea	0 - 1*	1400/150	-40/+150	Door check strap, rear bench seat adjustment	● ● ○	Special grease for noise damping, excellent compatibility with elastomers, good resistance to oxidation, low oil separation, prevents stick-slip, also available with UV tracer
Anti-friction coatings	<b>Berucoat AF 732</b>	Organ. binder	-	-	-70/+250	Catches, pawls, springs, locking cylinders	● ○ ○	Suitable for metal/metal material combinations, long-life coating, very good adhesion, no sticking of dust, prevents stick-slip, excellent protection against corrosion, oil resistant
	<b>Berucoat AF 320 E</b>	Organ. binder	-	-	-70/+250	Catches, pawls, springs, locking systems, spindels, plastic components	● ○ ○	Suitable for plastic/steel combinations, long-life coating, prevents stick-slip, no dust adsorption, excellent protection against corrosion, oil resistant, curing temperature +120 °C

\*Value indicates unworked penetration ● ○ ○ noise damping ● ● ○ good noise damping ● ● ● very good noise damping

## Approvals/references

(in alphabetical order)

- Brose group 53.2
- Brose group 53.4
- Daimler DBL 6827.42
- Edscha AG
- Fiat Specification 9.55580 Gras V
- Ford WSD-M1C 234 A2
- Ford WSS-M1C 238 B
- Ford WSS-M1C 253 A2
- GM 9986248
- Valeo
- VW-TL 778 A
- VW-TL 778 B



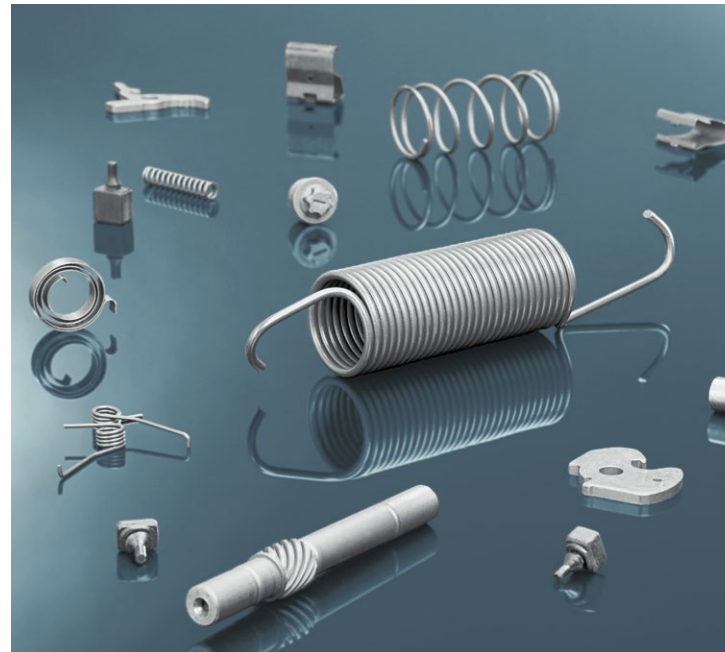


# Anti-friction coatings



» Anti-friction coatings play a decisive role.«

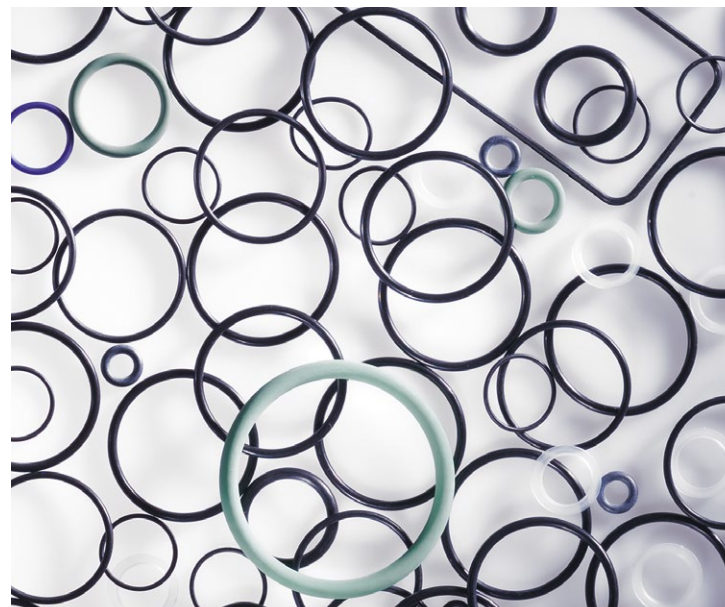
Anti-friction coatings are touch dry lubricant solutions for lifetime lubrication in most varied applications. Defined friction values, reduced wear and tribo-corrosion are only a few characteristics which allow these innovative coating technologies. The BECHEM coating product series each offer numerous advantages for all kinds of automotive applications, whether for metal materials, elastomers and plastics or leather and vinyl materials.



## Approvals / references

(in alphabetical order)

- Boshoku Automotive
- Daimler
- Faurecia
- GM W16531-Type 4
- GM W16531-Type 5
- Johnson Controls
- Lear Corporation
- Porsche
- Stoz

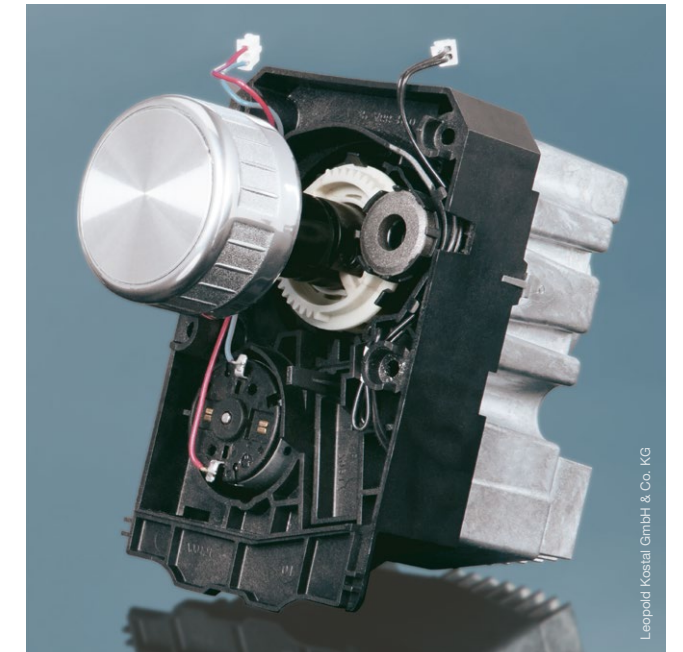


# Perfluoropolyether (PFPE) products



» Excellent temperature stability.«

The high performance PFPE based lubricants in the BECHEM range are chemically inert (non-reactive) towards most materials and therefore offer outstanding compatibility especially with plastics as well as excellent resistance to very high temperatures. PFPE based lubricant products are high-purity, fully synthetic base oils with an excellent ageing and oxidation stability.



## Approvals / references

(in alphabetical order)

- BMW group
- Delphi Automotive
- Faurecia
- Grammer
- Jaguar
- Kostal
- VW-TL 52141





# Noise damping in automotive applications



When it comes to lubrication-related matters in automobiles, the requirements profile also includes noise damping properties. Often, vibration is behind this noise. BECHEM offers a comprehensive range of products providing the right solution. As one of the first lubrication manufacturers, BECHEM has designed a case containing noise damping products and anti-friction coatings specifically for workshops, now established in the automotive industry.

Lubricants or anti-friction coatings should be considered as an engineered element early on in component development, as this is the only way to fine-tune to different material groups, temperature and climatic effects. Our standard range featuring over 250 special lubricants and noise damping products can be tailored to specific requirements.

Please get in touch with your responsible sales contact to order the BECHEM noise damping kit.



# Elastomer and plastic compatibility

Plastic compatibility of lubricants used in the automotive industry is of growing importance. The following table is an extract from the BECHEM brochure „Lubricants compatible with elastomers and plastics“ and includes information regarding the compatibility of selected BECHEM products.

Greases	
Synthetic hydrocarbons with metal soaps, polyurea or inorganic thickeners	PFPE (perfluoropolyether oils) with PTFE (polytetrafluoroethylene)
<b>Berulub FH 57</b> <b>Berulub FR 16</b> <b>Berulub FR 43</b> <b>Berusoft 10</b> <b>Berusoft 15</b> <b>BECHEM Ceritol PK 1</b> <b>BECHEM Ceritol PK 1 Soft</b>	<b>Beruglide L</b> <b>Berutox VPT 54-2</b> <b>Berulub FK 164-2</b> <b>Berulub ND-Fluid 160</b> <b>Berulub FK 164</b> <b>Dispersion OZF 1-10</b> <b>Berutox VPT 64</b> <b>Dispersion OZF 0,5-20</b>

Lubricating greases and their behaviour towards sealing materials (elastomers)

Abbreviation	Elastomers	Berulub FH 57 / Berulub FR 16 / Berulub FR 43 / Berusoft 10 / Berusoft 15 / BECHEM Ceritol PK 1 / BECHEM Ceritol PK 1 Soft	Beruglide L / Berutox VPT 54-2 / Berulub FK 164-2 / Berulub ND-Fluid 160 / Berulub FK 164 / Dispersion OZF 1-10 / Berutox VPT 64 / Dispersion OZF 0,5-20
ACM	Acrylate rubber	●	●
CR	Chloroprene rubber	◐	●
EPDM	Ethylene-propylene-diene rubber	◐	●
FKM/FPM	Fluorinated rubber	●	●
FEPM	Propylene-tetrafluoroethylene rubber	●	●
HNBR	Hydrogenated nitrile-butadiene rubber	●	●
NBR	Nitrile-butadiene rubber	◐	●
SBR	Styrene-butadiene rubber	◐	●

Lubricating greases and their behaviour towards plastic materials

Abbreviation	Plastics	Berulub FH 57 / Berulub FR 16 / Berulub FR 43 / Berusoft 10 / Berusoft 15 / BECHEM Ceritol PK 1 / BECHEM Ceritol PK 1 Soft	Beruglide L / Berutox VPT 54-2 / Berulub FK 164-2 / Berulub ND-Fluid 160 / Berulub FK 164 / Dispersion OZF 1-10 / Berutox VPT 64 / Dispersion OZF 0,5-20
ABS	Acrylonitrile-butadiene-styrene	●	●
PA 6	Polyamide (polycaprolactam)	●	●
PC	Polycarbonate	◐	●
PC/ABS	Polycarbonate/acrylonitrile-butadiene-styrene	◐	●
PE	Polyethylene	●	●
PET/PBT	Polyethylene-/polybutylene terephthalate	●	●
POM	Polyoxymethylene, polyacetal	●	●
PP	Polypropylene	●	●
PTFE	Polytetrafluoroethylene	●	●
PU	Polyurethane	●	●
PVC	Polyvinyl chloride	●	●
TPE-E	Thermoplastic elastomer (polyether/polyester)	◐	●

● resistant ◐ partly resistant ○ not resistant

The mentioned compatibilities are based on laboratory tests and references. In view of the variety of used raw materials as well as the complex chemical and morphological structure of the polymers the given information represent general tendencies only. In individual cases and especially prior to serial production the compatibilities should be confirmed by the supplier or verified in laboratory tests.

» Outstanding success worldwide – BECHEM products for plastic lubrication, «



# Lubrication solutions for industry



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