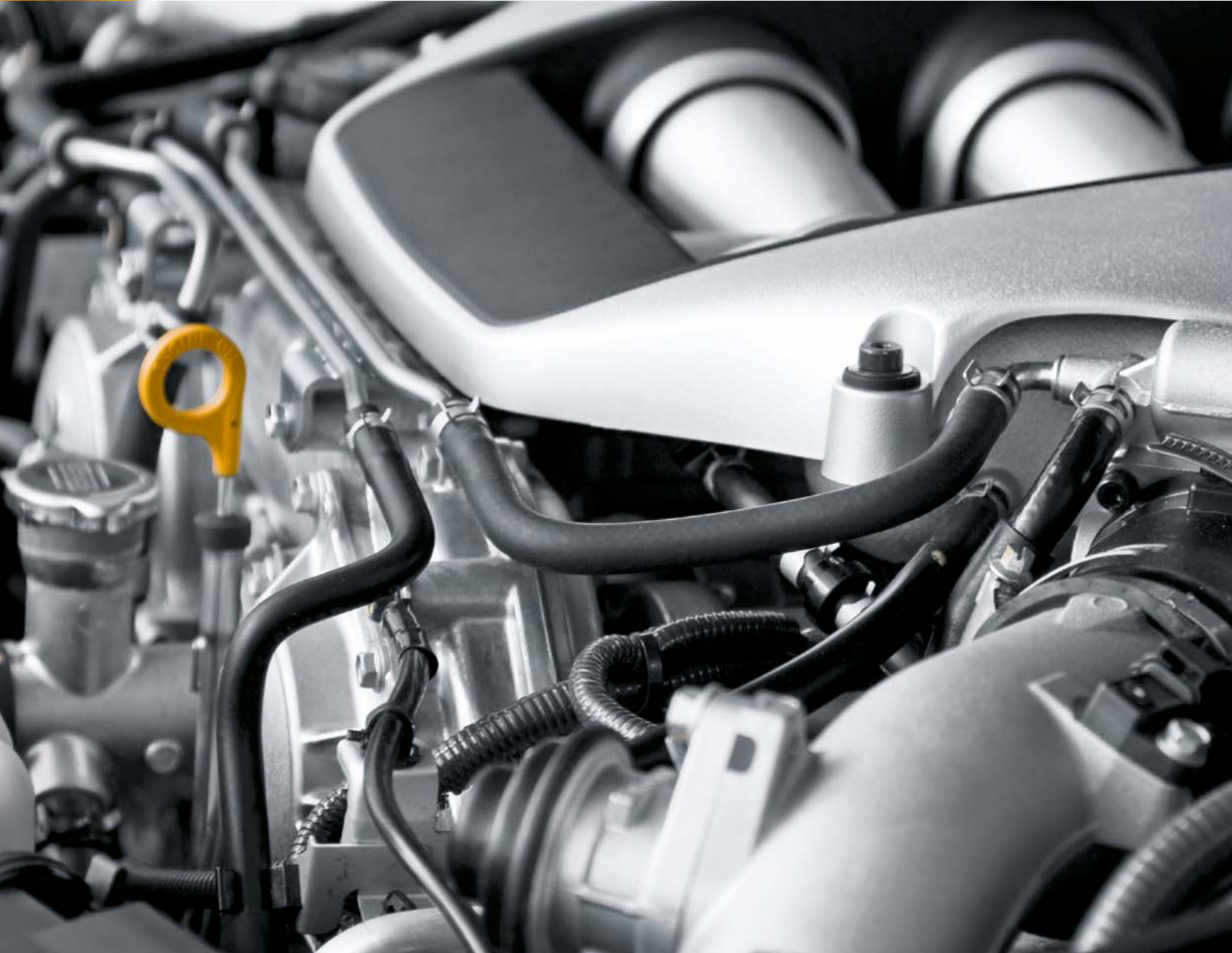


your global specialist

Detailed information

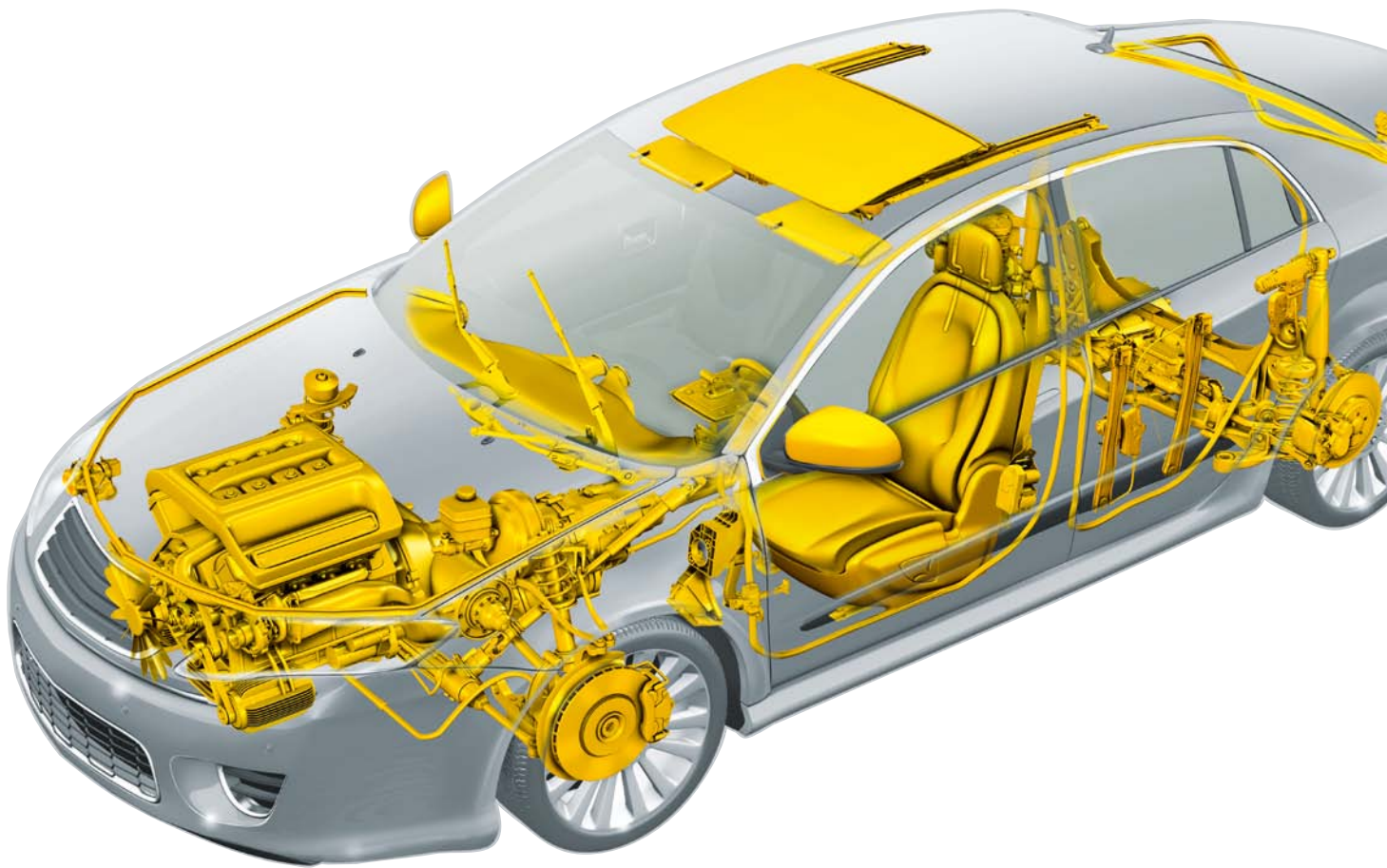
Driving with Klüber

Applications, speciality lubricants and approvals



Klüber Lubrication – driving your ideas

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It plays a vital role in every vehicle: the lubricant. As the world market leader for speciality lubricants, Klüber Lubrication offer outstanding tribological solutions for the automotive industry, contributing to safeguarding achievements, meeting future requirements and driving change. Our experience of more than 80 years and our team of highly qualified experts are there to support you – wherever you wish to go.

No matter what challenge the automotive industry is facing: Klüber Lubrication is there to take it - be it hydrogen propulsion, low-cost vehicles, downsized combustion engines, hybrid propulsions and electric motorcars.

Together with our customers, we work on the lubricant solution that brings maximum technological, economical and ecological benefit. 80 years of experience, highly qualified experts and a wide product range underpin the expertise and support Klüber Lubrication is able to offer with regard to the lubrication of vehicles: advice in application engineering, development partnerships, long-term testing on standard or own test rigs and a lot more.

Lubricants from Klüber Lubrication can be found everywhere in a vehicle. Approvals by almost all vehicle manufacturers and suppliers speak for themselves. From constant velocity joints to actuators for variable manifolds, from central locking mechanisms to electric contacts in e-vehicles, our lubricants have proven successful in series application. Nowadays, friction optimisation is crucial in automotive engineering.

If necessary, we will develop a new lubricant tailored to your application. Special pack sizes and private label designs are also available – just contact us.

This brochure is intended to provide you with a quick overview of applications and our speciality lubricants for automotive engineering as well as vehicle manufacturers' approvals.

Brakes



Components

- Disk brakes
- Drum brakes
- Electric brakes
- Anti-lock braking systems (ABS)
- Brake cables
- Proportioning valves
- Power brake units
- Master brake cylinders
- Vacuum pumps
- Assembly aids

Klüber products

Klüberalfa HX 83-301
Klüberalfa HX 83-302
Klüberfluid 9 R 100
Klüberpaste HEL 46-450
Klübersynth BLR 46-122
Klübersynth BR 46-82
Klübersynth HB 72-52
Klübersynth HLR 46-371
NONTROP GB 3 G
SYNTHESO GLEP 1
SYNTHESO GLK 0
SYNTHESO GLK 1
SYNTHESO GLK 1 PF
UNISILKON GL 301
UNISILKON GLK 112
WOLFRAKOTE TOP PASTE

Lubricant requirements

- Compatibility with elastomers, e.g. EPDM, SBR, CR
- Neutral behaviour towards plastics
- Resistance to brake fluids
- Wide temperature range
- High operational reliability during the entire service life
- High load-carrying capacity and good wear protection
- Noise damping
- Good corrosion protection
- Protection of electric contacts
- Avoiding paint-wetting impairment
- Adhesion to lubrication point

Product approvals/specifications (in alphabetical order)

Bosch VS 18314-Ft/N 28 FT 1140-002, Brembo D1.04.07.000, Continental (ATE) N 55315.03, Chrysler MS 9708, Ford ESA-M1C194-A, Ford WSA-M1C246-A, GM 9986206, Knorr N 503880, Lucas T.S. 2-32-101, Lucas T.S. 2-33-03, Meritor 2297-N-7164, PBR MS 1120, PBR MS 1124, Toyota TSK2522G, Toyota TSK2525G, VW-TL 52112, VW-TL 52150, Wabco JED 294, Wabco JED 785

Customers (in alphabetical order)

ADVICS (Aisin), Akebono, BMW, Bosch, Brembo, Continental, Daimler, Delphi, Ford, Knorr-Bremse, Meritor, Opel, PBR, Porsche, SEAT, TRW, WABCO, Volkswagen

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Steering systems



Components

- Steering columns
- Electric motors, small gears
- Telescopic steering shafts, intermediate shafts
- Rolling bearings, seals
- Steering gears, steering racks, ball screws
- Universal joints, steering couplings, tie rods, ball joints
- Electric steering systems in general

Lubricant requirements

- Low adjustment force at low temperatures
- Noise suppression and good damping properties
- Compatibility with materials used
- Good corrosion protection
- Prevention of fretting corrosion
- High load-carrying capacity and prevention of material fatigue

Klüber products

ISOFLEX TOPAS NB 52
ISOFLEX TOPAS NCA 52
Klübergrease LFT 71-402
Klüberlub EM 41-92
Klübersynth BM 44-42
Klübersynth GE 14-111
Klübersynth J 44-402
Klübersynth JIP 84-402
Klübersynth LE 44-31
Klübersynth LI 44-22
Klübersynth LR 44-21
MICROLUBE GL 262
SYNTHESO GLEP 1

Product approvals/specifications (in alphabetical order)

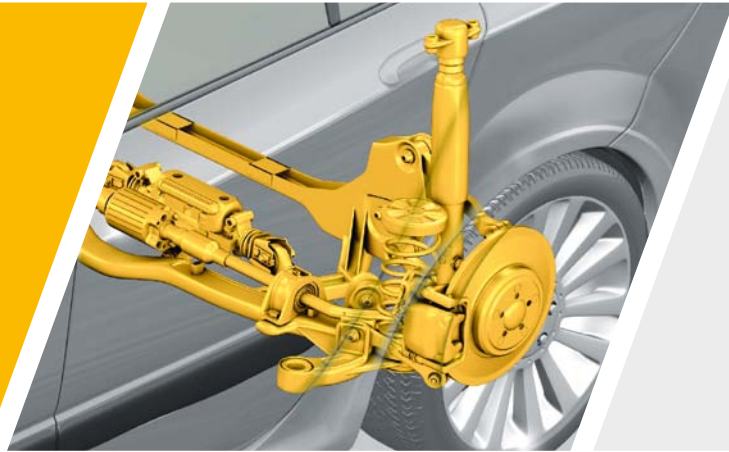
Daimler DBL 6834.00, Delphi 26113298, Ford ESF-M99B112-A, Ford WSD-M1C234-A2, Porsche 999.917.791.00, Toyota TSK2520G, TRW 62015002, VW-TL 721, VW-TL 778 B, VW-TL 52150, ZF Lemförder LMN 304 B, ZF Lemförder LMN 304 F, ZF Lemförder LMN 304 K

Customers (in alphabetical order)

Daimler, Dana, Delphi, Fujian Jinduo, General Motors, Hyundai, INAUXA, Jingzhou Henglong, JTEKT, KIA, KYB, Musashi, NSK, PEUGEOT, Raufoss, ThyssenKrupp Presta SteerTec, Timken, TRW, Visteon, Volkswagen, ZF

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Hub units and constant velocity joints



Components

- Suspension elements
- Seals
- Constant velocity joints
- Spline shafts
- Wheel bearings
- Shock absorbers
- Support bearings

Lubricant requirements

- Corrosion protection
- Lifetime lubrication
- Compatibility with elastomers
- Very good lubricating capacity for oscillating movements
- Very low friction values
- Protection against tribocorrosion
- Noise reduction
- Wear protection

Klüber products

DUOTEMPI PMY 45
ISOFLEX TOPAS NB 5051
ISOFLEX TOPAS NB 52
ISOFLEX TOPAS NCA 152
Klüberlub EH 71-241
Klüberlub EM 41-111
Klüberpaste 46 MR 401
Klüberplex BEM 34-132
Klübersynth RM 14-211
Klübersynth RM 14-211 Primer
MICORLUBE GL 261
MICROLUBE GL 262
POLYLUB GA 352 P
QUIETSCH-EX
SYNTHESO GLEP 1
UNISILKON TK 44 N2

Product approvals/specifications (in alphabetical order)

Daimler DBL 6817.00, Daimler DBL 6827.31, Ford ESA-M1C194-A, Opel B 0400882, Porsche 999.917.791.00, PSA X 10 1, PSA X 71 3100, Toyota TSK2522G, VW-TL 738, VW-TL 751, VW-TL 52133, VW-TL 52150

Customers (in alphabetical order)

Audi, BMW, Delphi, FAG, General Motors, GKN, NSK, Scania, SEAT, Valeo, Volkswagen

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Engines and under-hood components



Components

- Starters, start-stop starters
- Throttles, injection pumps
- Alternators, belt tensioners
- Turbo chargers, water pumps
- EGR valves, wastegates and manifold actuators
- Electric contacts, fan bearings, plug connections for fuel lines and cooling conduits

Klüber products

BARRIERTA K series
BARRIERTA L series
ISOFLEX LDS 18 Special A
ISOFLEX TOPAS NCA 52
Klüberpaste HEL 46-450
Klübersynth BEP 72-82
Klübersynth BR 46-82
Klübersynth EL 42-32
Klübersynth HB 72-102
Klübersynth LP 42-32
Klüber Noxlub KF 1920
PETAMO GHY 133 N
PETAMO GY 193
UNIMOLY HTC Metallic
WOLFRACOAT C

Lubricant requirements

- Very good high-temperature stability
- Maintenance-free
- Low starting and running torque
- Long-term lubrication
- Material compatibility (e.g. seals, hoses, casings)
- Resistance to ambient media

Product approvals/specifications (in alphabetical order)

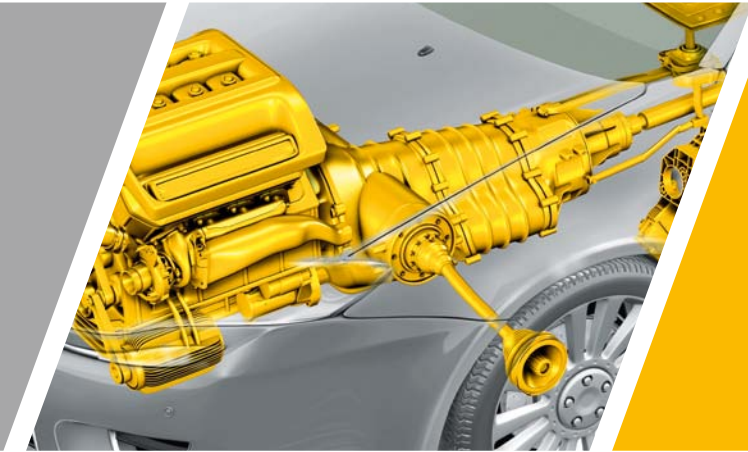
Bosch FS 18570-Ft, Bosch VS 10832-Ft, Bosch VS 18099-Ft, Brembo D1.04.18.000, Daimler DBL 6834.00, Ford WSD-M138P8A1, Opel B 0401122, PSA X 71 3134, Toyota TSK2524G, VW-TL 776, VW-TL 778, VW-TL 52112, VW-TL 52141, VW-TL 52172

Customers (in alphabetical order)

Audi, BMW, Bosch, Continental, Daimler, Delphi, DENSO, General Motors, Hyundai, KIA, Litens, Magneti Marelli, MAHLE, Mazda, Mubea, PSA Peugeot Citroën, Scania, Toyota, TRW, Visteon, Volvo, Volkswagen

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Clutches



Components

- Master cylinders, slave cylinders
- Clutch release bearings, spline joints
- Dual mass flywheels

Klüber products

Klüberalfa HM 83-801
Klübersynth BEP 72-82
Klübersynth HB 72-102
Klübersynth HIP 84-401
Klübersynth HLR 46-371
MICROLUBE GL 261
MICROLUBE GNY 202
PETAMO GY 193
SYNTHESO GLK 1
UNISILKON GLK 112
UNISILKON GLK 1301

Lubricant requirements

- Protection against tribocorrosion
- Lifetime lubrication
- Elastomer compatibility
- Wide service temperature range
- Good wear protection
- No stick-slip
- Compatibility with brake fluids

Product approvals/specifications (in alphabetical order)

Ford ESD-M1C220-A, Ford ESF-M1C 43-A2, Opel B 0400043,
Opel B 0400571, VW-TL 760, VW-TL 767 X

Customers (in alphabetical order)

Audi, Automotive Products, BMW, Daimler, FAG, Ford,
FTE automotive, GAT, GETRAG, Hyundai, INA, LuK,
Magneti Marelli, NTN, Opel, PHA, Valeo, Voith, Volkswagen, ZF

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Gearshift



Components

- Seals
- Plain bearing bushes
- Gear shift linkage
- Gear shifting gates
- Bowden cables

Klüber products

ISOFLEX TOPAS L 32
ISOFLEX TOPAS L 32 N
Klübersynth LIP 84-42
POLYLUB GLY 801
UNISILKON GLK 112

Lubricant requirements

- Lifetime lubrication
- Compatibility with elastomers
- Corrosion protection
- Good damping capacity
- Wide service temperature range

Product approvals/specifications (in alphabetical order)

Chrysler MS 9958, Ford ESF-M1C 43-A2, Ford WSD-M1C244-A, Opel B 0400571, Opel B 0401138, PSA B 71 3841, PSA X 71 3102, VW-TL 52147, VW-TL 767 X, VW-TL 52142, ZF LMN 304

Customers (in alphabetical order)

Audi, BMW, Daimler, DURA, ECS, Ford, Himmermann, Hyundai, JOPP, KIA, Opel, PSA Peugeot Citroën, Teleflex, Volkswagen, Woco, ZF

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Locks and hinges



Components

- Latches, hinges
- Locks, Bowden cables
- Door check arms, central locking mechanisms
- Catch bolts, locking pawls

Klüber products

CENTOPLEX 1 DL
ISOFLEX LDS 18 Special A
ISOFLEX TOPAS L 32
ISOFLEX TOPAS L 32 N
ISOFLEX TOPAS NB 152
Klüberalfa IR 83-22
Klübersynth LI 44-22
Klübersynth LIP 84-42
Klüberstop TM 06-111
STABUTHERM GH 461
SYNTHESES GLEP 1
UNISILKON GLK 112

Lubricant requirements

- Good low-temperature properties
- Resistance to water and de-icers
- Corrosion protection
- Lifetime lubrication
- Compatibility with paints

Product approvals/specifications (in alphabetical order)

Chrysler MS 9958, Daimler DBL 6827.40,
FordESF-M1C43-A2, FordWSB-M1C160-D2, FordWSD-M1C234-A,
Ford WSD-M1C234-A2, Ford WSD-M1C238-A, Opel B 0400571,
Opel B 0400852, Opel B 0400858, Opel B 0401122,
Porsche 999.917.544.00, Porsche 999.917.790.00,
PSA B 71 3841, Toyota TSK2522G, VW-TL 778, VW-TL 778 A,
VW-TL 778 B, VW-TL 767 X, VW-TL 52141, VW-TL 52150

Customers (in alphabetical order)

ArvinMeritor, Audi, BMW, Daimler, Edscha, Ford, Gammastamp,
Gestamp, General Motors, Huf, Hyundai, KIA, Kiekert, Magna,
MGI COUTIER, Opel, STRATTEC, Valeo, Volkswagen, WITTE

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Electrics and passenger compartment



Components

- Electric motors
- Heating and cooling systems
- Dashboards
- Small gears
- Fans
- Electrical switches
- Mechanical switches
- Windscreen wipers
- Sun visors
- Mirrors
- Plug-in contacts

Klüber products

BARRIERTA series
CONSTANT GLY 2100
CONSTANT OY oil series
DUOTEMPI PMY 45
ISOFLEX LDS 18 Special A
ISOFLEX TOPAS L 32
ISOFLEX TOPAS L 32 N
ISOFLEX TOPAS NB 52
Klüberalfa K 83-735
Klüberelectric KR 44-22
Klüberelectric KR 44-102
Klübersynth MR 96-31
Klüberelectric KR 44-402
Klübersynth LI 44-22
Klübersynth LR 44-21
Klübersynth RA 44-702
Klübersynth RA 44-3502
MIKROZELLA series
Klüber Noxlub series
POLYLUB GLY 151
POLYLUB GLY 501
POLYLUB GLY 801

Lubricant requirements

- Low breakaway torque at low temperatures
- Lifetime lubrication
- Material compatibility
- Wide temperature range
- Good surface adhesion
- Mechanical damping
- Noise damping

Product approvals/specifications (in alphabetical order)

Chrysler MS 9958, Daimler DBL 6827.40, Ford WSB-M1C160-D2, Ford WSD-M1C244-A, Ford WSD-M1C234-A2, Opel B 0400858, Opel B 0400882, Opel B 0401122, Opel B0401138, Porsche999.917.790.00, Porsche999.917.791.00, PSA B 71 3841, Toyota TSK2522G, VW-TL 778, VW-TL 778 A, VW-TL 778 B, VW-TL 751, VW-TL 52147

Customers (in alphabetical order)

Audi, BMW, Bosch, Britax, Daimler, Faurecia, Ficosa, Ford, Grammer, Hella, Johnson Controls, KOSTAL, Magna, Niles Parts, NMB, NSK, Opel, PSA Peugeot Citroën, Valeo, Volkswagen, Wintech

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Window lifters and sun roofs



Components

- Electric motors
- Guiding rails
- Small gears
- Bowden cables
- Toothed segments

Lubricant requirements

- Low noise level
- Good low-temperature properties
- Compatibility with plastics and elastomers
- Surface adhesion
- Damping properties

Klüber products

ISOFLEX TOPAS L 32
ISOFLEX TOPAS L 32 N
ISOFLEX TOPAS L 32 CN
Klüberlub EM 41-142
Klüberlub LM 41-32N
Klübersynth LF 44-22
Klübersynth LI 44-22
Klübersynth LM 41-102
Klübersynth LR 44-21
Klübersynth P 84-52 G
POLYLUB GLY 151
POLYLUB GLY 501
POLYLUB GLY 801
UNISILKON GLK 112

Product approvals/specifications (in alphabetical order)

Chrysler MS 9958, Daimler DBL 6827.40,
Ford ESF-M1C 43-A2, Ford WSB-M1C160-D2,
Ford WSD-M1C244-A, Ford WSD-M1C234-A2,
Opel B 0400571, Opel B 0400858, Opel B 0401138,
PSA B 71 3841, Toyota TSK2522G, VW-TL 751,
VW-TL 778 A, VW-TL 778 B, VW-TL 767 X, VW-TL 52147

Customers (in alphabetical order)

Audi, Bosch, Bouverat, Brose, Daimler, Ford, General Motors,
Grupo Antolin, IGARASHI, IMS Gear, Inalfa, Inteva,
Johnson Electric, Mitsuba, Nuova SME, Lames, PHA, PRS,
Saab, Leggett & Platt, Schukra, UNUS International SpA,
Volkswagen, Webasto

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Seats and seat belts



Components

- Retractors, electric motors
- Flexible shafts, buckles
- Small gears, retractor springs
- Screw spindles, seat rails
- Belt tensioners, belt loops
- Adjusting units, toothed segments

Klüber products

CENTOPLEX CX 3/350
ISOFLEX LDS 18 Special A
ISOFLEX TOPAS L 32
ISOFLEX TOPAS L 32 N
ISOFLEX TOPAS NB 5051
ISOFLEX TOPAS NB 52
Klüberlub EM 41-142
Klüberpaste UH1 84-201
Klübersynth LF 44-22
Klübersynth LR 44-21
Klübertop TP 39-311
Klübertop TP 41 A/B
Klübertop TP 42 A/B
POLYLUB GLY 801
UNISILKON GLK 112

Lubricant requirements

- Lifetime lubrication
- Wide temperature range
- Low breakaway torque
- Good damping properties
- Surface adhesion
- Paintability
- Emergency lubricating properties

Product approvals/specifications (in alphabetical order)

Chrysler MS 9958, Daimler DBL 6827.40, Ford WSB-M1C160-D2, Ford WSD-M1C244-A, Ford WSS-M99C123-A, Opel B 0400858, Opel B 0401138, Toyota TSK 2522G, VW-TL 778 A, VW-TL 52147

Customers (in alphabetical order)

Audi, Autoliv, BMW, Brose, CRH, Daimler, DAS, Faurecia, Ford, General Motors, Grammer, Hyundai, Johnson Controls, Keiper, KERN-LIEBERS, KIA, Lear, Magna, Sitech, TRW, Volkswagen

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness

Profiled seals



Components

- Car body seals
- Door seals
- Folding top seals
- Sun roof seals
- Window channels and guides
- Trunk seals

Klüber products

Klüberflex 100-0
Klübertop TP 18-810
Klübertop TP 22-1310 A/B
Klübertop TP 27-1310 A/B
Klübertop TP 27-1311
Klübertop TP 28-1311
Klübertop TP 31-1310 A/B
Klübertop TP 37-1310 A/B P

Lubricant requirements

- Wear protection
- Noise reduction
- Freeze release
- Pleasant haptics
- Assembly aid


You will find bonded coatings from Klüber Lubrication in cars of the following manufacturers (in alphabetical order):

Alfa Romeo, Audi, BMW, Daimler, Fiat, Ford, Hyundai, Jaguar, KIA, Nissan, Opel, SAAB, Volkswagen

Customers (in alphabetical order)

Cooper-Standard, Dongil Rubber, Draftex Automotive, ELDISY, GTG Gummitechnik, Henniges Automotive, Meteor, Metzeler Automotive Profile Systems, SAARGUMMI, Vorwerk-Dichtungssysteme

Please note that the a.m. information is only a small extract from our range of products and applications with no claim of completeness



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The data in this document is based on our general experience and knowledge at the time of publication and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary field tests with the product selected for a specific application. All data are guide values which depend on the lubricant's composition, the intended use and the application method. The technical values of lubricants change depending on the mechanical, dynamical, chemical and thermal loads, time and pressure. These changes may affect the function of a component. We recommend contacting us to discuss your specific application. If possible we will be pleased to provide a sample for testing on request. Products from Klüber Lubrication products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this document at any time without notice.

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Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.



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