

your global specialist

Powerful, naturally.

Environmentally acceptable and biodegradable
lubricants for the marine industry



Combine environmental and economic benefits with speciality lubricants from Klüber Lubrication



Superior environmentally friendly lubricant portfolio – Powerful, naturally

Reducing impacts from shipping operations on the environment is important to the future of our planet. We are increasingly successful in developing products suited to comply with the requirements of the marine industry. Klüber Lubrication already has the most comprehensive range of lubricants for this industry, meeting the highest environmental requirements.

Your economic benefits – we offer more than lubricants

Efficiency, sustainability, competitiveness and profitability are crucial for business success. Our products and services can contribute to your success and competitiveness. In a personal exchange with you, we would like to introduce our services and discuss the comprehensive advantages of our products.

Klüber Lubrication – the benchmark for speciality lubricants

Our wide portfolio of synthetic, environmentally friendly lubricants is a real alternative to conventional mineral oils. Unique tribological know how, raw materials of highest quality, customised additive packages and our decades of experience in designing lubricants in close cooperation with leading OEMs from different industries are the backbone for our benchmark-setting marine product range.

Whether hydrodynamic oil film thickness, load carrying capacity, corrosion protection, water washout stability, resistance to hydrolysis and oxidation or low-temperature performance – our speciality lubricants are right at the forefront of lubrication.

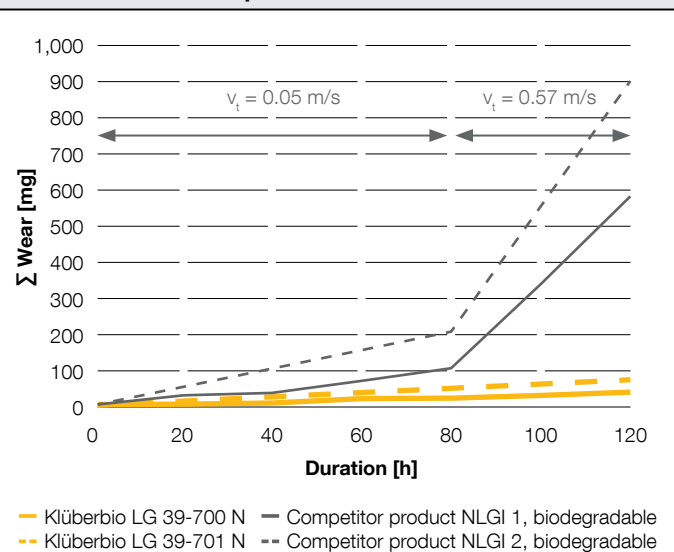
An example: superior wear protection with Klüberbio LG 39-700 N / 701 N

Klüber Lubrication's new open gear greases – formulated with more than 90% renewable materials – combine biodegradability and strong performance.

Klüberbio LG 39-700 N and 701 N set benchmarks in wear protection, low-temperature performance and reduced environmental impact:

- Lifetime of equipment
- Energy consumption
- Operational costs
- Reliability and efficiency

Modified FZG slow speed wear test acc. to DGMK 377-01



Klüberbio LG 39-700 N and 701 N show lower wear rates than other open gear lubricants.



Legislation, regulation and compliance – we are your reliable partner

Klüber Lubrication only launches a new lubricant after it has been put through extensive testing. Based on own and external test results and findings we develop powerful, innovative lubricants which are in line with the legal requirements, e.g. environmentally acceptable lubricants (EALs), Ecolabel and OSPAR.

Market leader – more than 90 years of experience

Klüber Lubrication is the global market leader in speciality lubricants and tribological high-end solutions. Multinational groups as well as small- and medium-sized companies from a wide variety of industries have been relying on our competence and know-how.

We are closer to you – wherever you are

Lubricants made by Klüber Lubrication are available in the same high quality worldwide. Due to our global standing, one of our experts is always close to you. We look forward to meeting you.

Please see www.klueber.com/marine for more information about us and our speciality lubricants for the marine industry.

An example: superior hydrodynamic oil film thickness with Klüberbio RM 2 stern tube oils

Oil film thickness ensuring hydrodynamic lubrication is a key prerequisite for reliable operation of propeller shafts.

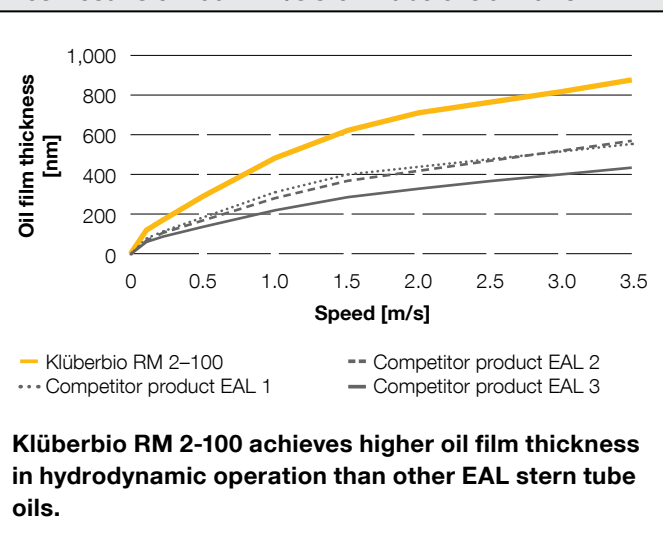
Klüberbio RM 2-100/150 oils provide a relatively higher oil film thickness and load carrying capacity under dynamic operation than other available EALs and thus prevent high-temperature alarms and journal bearing failures.

Further key performance characteristics and advantages are:

- Resistance against scoring/wear
- Shear and oxidation stability
- Inherent viscosity of base oil – no viscosity improvers added
- Good seal compatibility (approved by all leading OEMs)
- Demulsifying oil

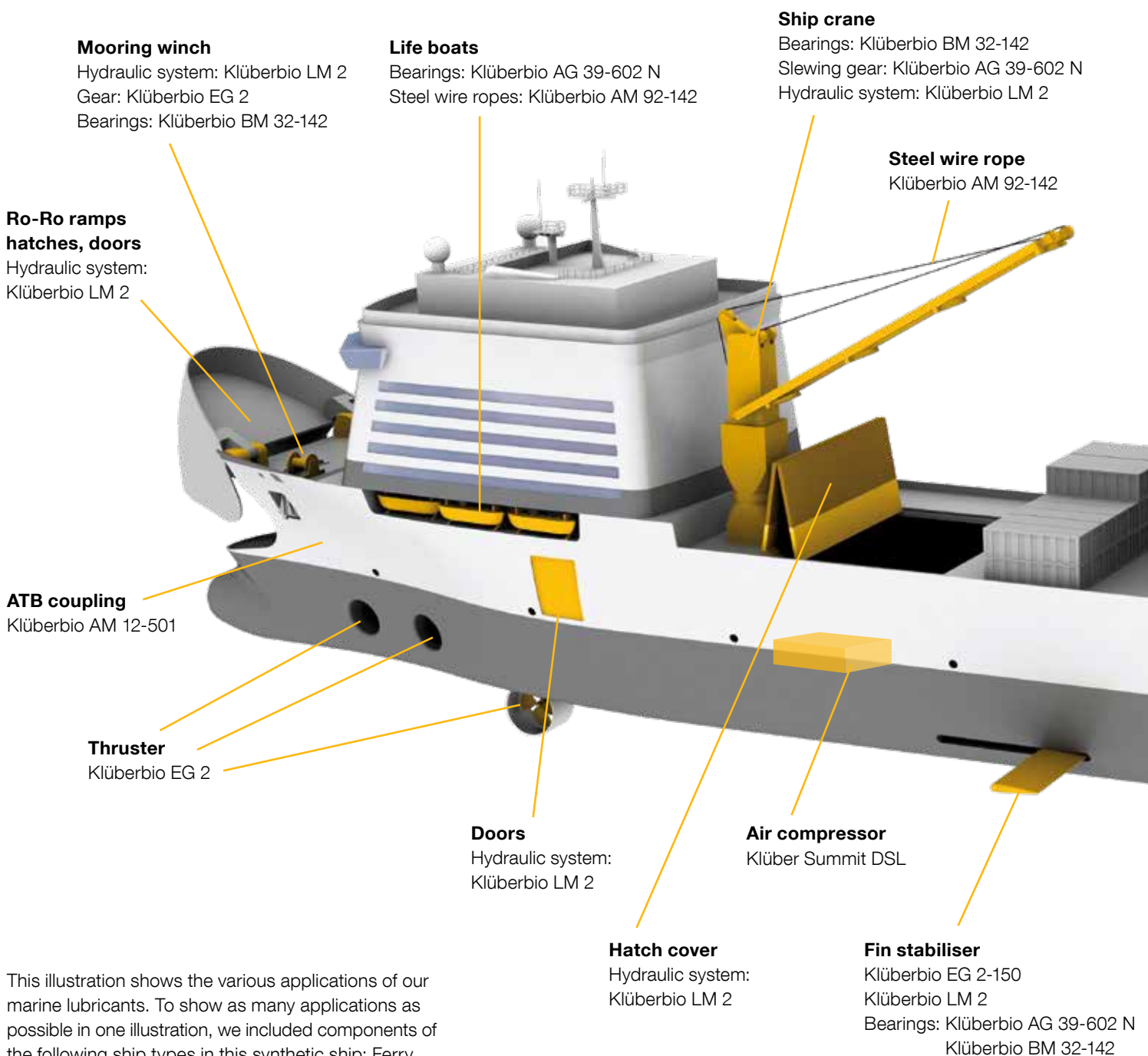
Oil film thickness vs. speed

Test results of 100 mm²/s stern tube oils at 40 °C



Lubricant film thickness was measured using an optical interferometry technique with an EHD 2 ultrathin film measurement system.

Selection of speciality lubricants on board

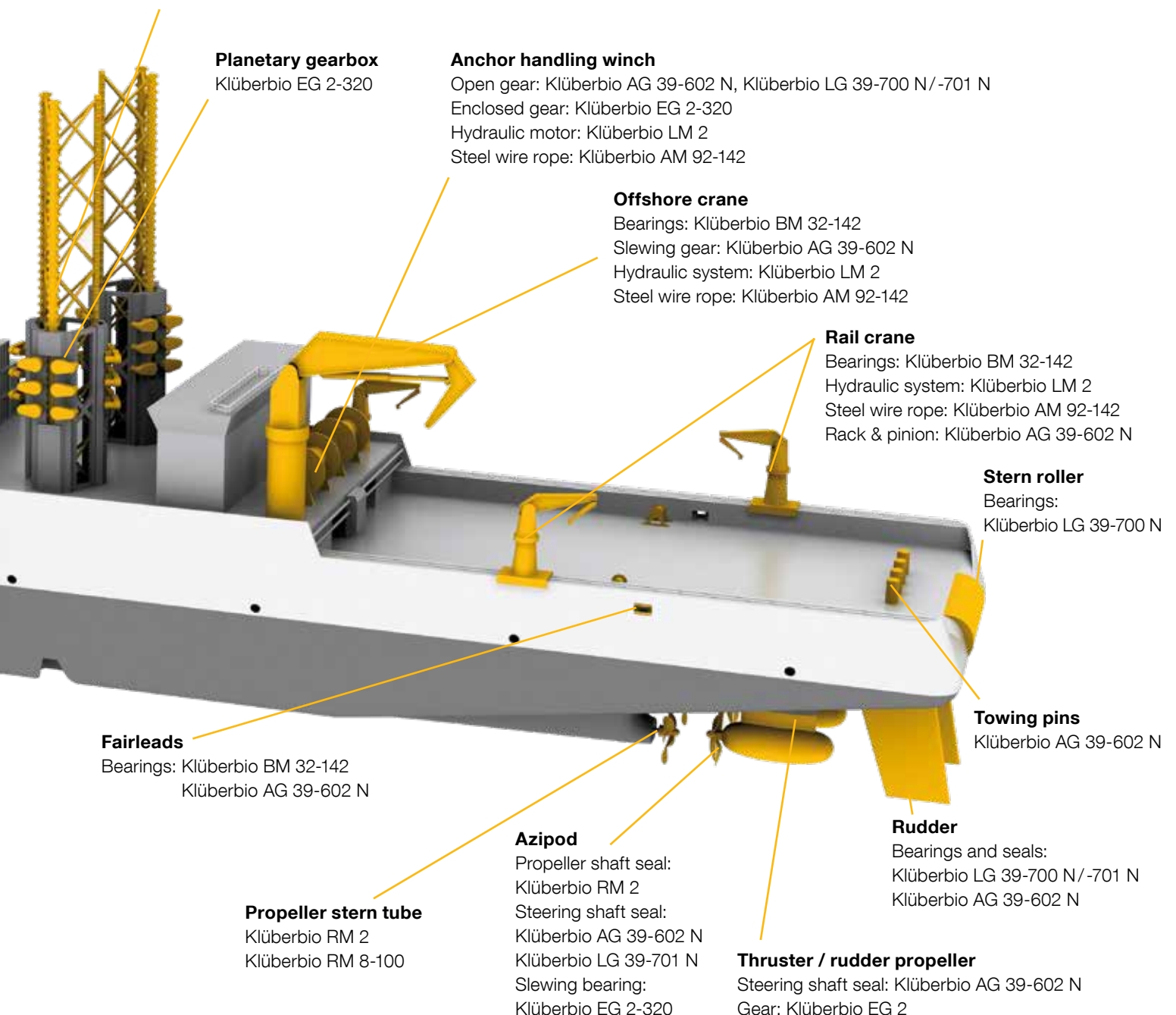


This illustration shows the various applications of our marine lubricants. To show as many applications as possible in one illustration, we included components of the following ship types in this synthetic ship: Ferry, cruise ship, cargo ship, wind turbine installation vessel, anchor handling tug supply vessel.



Jacking system

Tooth rack & pinion: Klüberbio LG 39-700 N/-701 N
 Klüberbio AG 39-602 N



Planetary gearbox
 Klüberbio EG 2-320

Anchor handling winch
 Open gear: Klüberbio AG 39-602 N, Klüberbio LG 39-700 N/-701 N
 Enclosed gear: Klüberbio EG 2-320
 Hydraulic motor: Klüberbio LM 2
 Steel wire rope: Klüberbio AM 92-142

Offshore crane
 Bearings: Klüberbio BM 32-142
 Slewing gear: Klüberbio AG 39-602 N
 Hydraulic system: Klüberbio LM 2
 Steel wire rope: Klüberbio AM 92-142

Rail crane
 Bearings: Klüberbio BM 32-142
 Hydraulic system: Klüberbio LM 2
 Steel wire rope: Klüberbio AM 92-142
 Rack & pinion: Klüberbio AG 39-602 N

Stern roller
 Bearings:
 Klüberbio LG 39-700 N

Towing pins
 Klüberbio AG 39-602 N

Rudder
 Bearings and seals:
 Klüberbio LG 39-700 N/-701 N
 Klüberbio AG 39-602 N





Thruster / rudder propeller
 Steering shaft seal: Klüberbio AG 39-602 N
 Gear: Klüberbio EG 2

Azipod
 Propeller shaft seal:
 Klüberbio RM 2
 Steering shaft seal:
 Klüberbio AG 39-602 N
 Klüberbio LG 39-701 N
 Slewing bearing:
 Klüberbio EG 2-320

Propeller stern tube
 Klüberbio RM 2
 Klüberbio RM 8-100

Fairleads
 Bearings: Klüberbio BM 32-142
 Klüberbio AG 39-602 N

Environmentally acceptable (EAL) and biodegradable lubricants for the marine industry

Product type	Speciality lubricant from Klüber Lubrication	Characteristic and environmentally relevant information	Module (selection)	Component (selection)
Stern tube oil	Klüberbio RM 2-100 Klüberbio RM 2-150 Klüberbio RM 8-100	<ul style="list-style-type: none"> – ISO VG 100 – Biodegradability > 60 % – European Ecolabel, for Klüberbio RM 8-100³⁾ – EAL 	<ul style="list-style-type: none"> – Controllable pitch propeller – Fixed pitch propeller 	<ul style="list-style-type: none"> – Stern tube bearing and propeller shaft seal
Gear oil	Klüberbio EG 2-68 Klüberbio EG 2-100 Klüberbio EG 2-150 Klüberbio EG 2-320	<ul style="list-style-type: none"> – ISO VG 68/100/150/320 – Meet CLP requirements according to ISO 51517-3 – Biodegradability > 60 % – European Ecolabel (only Klüberbio EG 2-150) – EAL 	<ul style="list-style-type: none"> – Thruster – Azipod from ABB – Anchor handling/mooring winch 	<ul style="list-style-type: none"> – Gear set, bearings and seal
Hydraulic oil ²⁾	Klüberbio LM 2-22 ²⁾ Klüberbio LM 2-32 ²⁾ Klüberbio LM 2-46 ²⁾	<ul style="list-style-type: none"> – ISO VG 22/32/46 – Meet HEES requirements according to DIN ISO 15380 – Biodegradability > 60 % – Swedish Standard SP 15 54 34 – EAL 	<ul style="list-style-type: none"> – Anchor handling/mooring winch – Ship crane – Offshore crane – Controllable pitch propeller 	<ul style="list-style-type: none"> – Hydraulic motor – Hydraulic components – Servo piston inside the hub of CP propeller
Chain oil	Klüberbio C 2-46	<ul style="list-style-type: none"> – ISO VG 46 – Biodegradability > 60 % 	<ul style="list-style-type: none"> – Derrick 	<ul style="list-style-type: none"> – Chain
Compressor oil	Klüber Summit DSL 32 Klüber Summit DSL 46 Klüber Summit DSL 68 Klüber Summit DSL 100 ¹⁾	<ul style="list-style-type: none"> – ISO VG 32/46/68/100 – Biodegradability > 60 % 	<ul style="list-style-type: none"> – Air compressor 	<ul style="list-style-type: none"> – Air compressor
Open gear grease	Klüberbio LG 39-700 N Klüberbio LG 39-701 N	<ul style="list-style-type: none"> – NLGI 0, NLGI 1 – Biodegradability > 60 % – OSPAR, Denmark, Norway Yellow 1 – EAL 	<ul style="list-style-type: none"> – Jack-up system – Anchor handling winch – Stern roller – Rudder bearing 	<ul style="list-style-type: none"> – Rack and pinion gear – Open gear – Slow turning bearing
Open gear and steel wire rope grease	Klüberbio AG 39-602 N	<ul style="list-style-type: none"> – NLGI 1 – 2 – Biodegradability > 60 % – European Ecolabel³⁾ – EAL 	<ul style="list-style-type: none"> – Jack-up system – Anchor handling/mooring winch – Ship crane – Offshore crane – Thruster/Azipod (sealing grease) 	<ul style="list-style-type: none"> – Rack and pinion gear – Open gear – Steel wire rope – Bar guide at spooling device – Slow turning slide bearing – Seal
Multi-purpose EP 2 grease	Klüberbio BM 32-142	<ul style="list-style-type: none"> – NLGI 2 – Biodegradability > 60 % – European Ecolabel³⁾ – EAL 	<ul style="list-style-type: none"> – Deck machinery 	<ul style="list-style-type: none"> – Bearings
Multi-purpose EP 2 grease	Klüberbio M 72-82	<ul style="list-style-type: none"> – NLGI 2 – Biodegradability > 60 % 	<ul style="list-style-type: none"> – Deck machinery 	<ul style="list-style-type: none"> – Bearings – Seal
Wire rope grease	Klüberbio AM 92-142	<ul style="list-style-type: none"> – NLGI 2 – Biodegradability > 60 % – EAL 	<ul style="list-style-type: none"> – Offshore crane – Ship crane – Anchor handling/mooring winch 	<ul style="list-style-type: none"> – Steel wire rope
ATB coupling grease	Klüberbio AM 12-501	<ul style="list-style-type: none"> – NLGI 1 – Biodegradability > 60 % – EAL 	<ul style="list-style-type: none"> – ATB coupling 	<ul style="list-style-type: none"> – Bearings – Pin
Rust removing agent	Klüberbio Z 2-5	<ul style="list-style-type: none"> – ISO VG 5 – Biodegradability > 60 % 	<ul style="list-style-type: none"> – Miscellaneous 	

ISO viscosity class according to DIN ISO 3448; Consistency grade according to DIN 51818; Biodegradability according to OECD 301 F/B test after 28 days
EAL – lubricant complies with requirements of Environmentally Acceptable Lubricants as defined in Appendix A of the 2013 Vessel General Permit

¹⁾ Biodegradability according to OECD 301 B after 35 days; ²⁾ available from 2021; ³⁾ from Q3/2021



For an overview of our other lubricants for the marine industry, please see our brochure “Seaworthy“

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Klüber Lubrication München SE & Co. KG
Geisenhausenerstraße 7
81379 München
Germany

Local first-instance court Munich, Germany
Certificate of registration 46624

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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 90 years.

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