Klüberbio EG 2-68, 2-100, 2-150, 2-320

Environmentally compatible, synthetic high-performance gear oils

Your benefits at a glance

- Comply with the requirements for Environmentally Acceptable Lubricants as defined in Appendix A of the EPA 2013 VGP (Vessel General Permit)
- Ultimately biodegradable and not toxic to marine organisms reducing environmental impact in the event of leakage
- Klüberbio EG 2 oils have a high scuffing resistance, protecting gear teeth reliably against fretting damage even at high peak loads
- Standard NBR and FKM elastomers of the leading propeller shaft seal manufacturers are resistant to and approved for use with Klüberbio EG 2 oils, preventing leakages and impurities

Your requirements - our solution

Klüberbio EG 2 oils are ultimately biodegradable gear oils based on synthetic ester oil. They contain ≥90 % of renewable raw materials.

Klüberbio EG 2 oils show a high shear stability and form a strong hydrodydamic oil film even when subject to high loads. They have a high scuffing resistance, protecting gear teeth reliably against fretting damage even at high peak loads.

Klüberbio EG 2 oils achieve the U.S. EPA's requirements for classification as an Environmentally Acceptable Lubricant (EAL). Therefore, these high-performance lubricants meet the biodegradability, minimally toxic, and non-bioaccumulating standards set in Appendix A of the U.S. EPA's 2013 VGP (Vessel General Permit).

Klüberbio EG 2-150 also complies with the European Ecolabel.

The EU Ecolabel is a label of environmental excellence that is awarded to products and services meeting high environmental standards throughout their life cycle: from raw material extraction, to production, distribution and disposal.

Application

Klüberbio EG 2 oils were developed for the lubrication of ships' gearboxes, particularly for thrusters and rudder propellers. Leading manufacturers of thrusters and propeller shaft seals have tested and approved these oils.

Please contact Klüber Lubrication or the manufacturer of the seal or thruster for technical consultation on your specific seal-lubricant combination.

Klüberbio EG 2 oils protect rolling elements effectively against wear and pitting, thus complying with the requirements of rolling bearing manufacturers for highly loaded, large rolling bearings in pod drives.

Klüberbio EG 2-68, 100 and 320 oils can also be used for the lubrication of open-running drive and conveyor chains, e.g. in installations and machines in agriculture, forestry and water resources industries as well as for horticultural appliances.

Application notes

In general, our completely biodegradable high-performance gear oils are miscible with mineral oils and synthetic hydrocarbons. However, a miscibility test should be performed in order to totally rule out the possibility of an incompatibility between different additives. Prior to changeover, we recommend cleaning the lube points or flushing the gear with the Klüberbio EG 2 oil to be used.

The Klüberbio EG 2 oil to be used needsto be approved by the OEMs of the equipment. In case the oil is not approved or the equipment's specification has been changed - e.g. type, design or material of the sealing - we recommend consulting the OEM prior to the oil change.

Owing to the many different elastomer compositions of seals we recommend - prior to series application - checking the compatibility and other influencing factors (e.g. maximum admissible water content in the oil) with the component under conditions similar to practice.

Material safety data sheets

Material safety data sheets can be requested via our website www.klueber.com. You may also obtain them through your contact person at Klüber Lubrication.

KLÜBER LUBRICATION

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Pack sizes	Klüberbio EG 2-68	Klüberbio EG 2-100	Klüberbio EG 2-150	Klüberbio EG 2-320
Canister 1 l	+	+	+	+
Canister 5 l		+		
Canister 19 l			+	
Canister 20 l	+	+	+	+
Drum 200 l	+	+	+	+

Characteristics	Klüberbio EG 2-68	Klüberbio EG 2-100	Klüberbio EG 2-150	Klüberbio EG 2-320
Article number	009043	009039	009030	009057
Colour space	yellow	yellow		yellow
Service temperature, lower limit	-25 °C	-25 °C	-25 °C	-25 °C
Service temperature, upper limit	120 °C	120 °C	120 °C	120 °C
Conformance, CLP, DIN 51517-3	passed	passed	passed	
Designation, DIN 51502	CLP E 68	CLP E 100	CLP E 150	CLP E 320
EU Ecolabel registration number			DE/027/260	
Biodegradability, OECD 301 F	≥ 60 %	≥ 60 %	≥ 60 %	≥ 60 %
Density, DIN 51757, 15°C	approx. 909 kg/m³	approx. 919 kg/m³	approx. 927 kg/m³	approx. 943 kg/m³
Flash point, DIN EN ISO 2592, Cleveland open cup	≥ 260 °C	≥ 280 °C	≥ 280 °C	≥ 270 °C
Foam test, ISO 6247 / ASTM D892, 24°C, sequence I	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
Foam test, ISO 6247 / ASTM D892, 24°C, sequence III	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
Foam test, ISO 6247 / ASTM D892, 93.5°C, sequence II	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
ISO viscosity grade, DIN ISO 3448, ISO VG	68	100	150	320
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 100°C	approx. 11 mm²/s	approx. 14 mm²/s	approx. 18 mm²/s	approx. 34 mm²/s
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 40°C	approx. 68 mm²/s	approx. 100 mm²/s	approx. 150 mm²/s	approx. 320 mm²/s
Viscosity index, DIN ISO 2909	approx. 140	approx. 140	approx. 135	approx. 150
Copper corrosion, DIN EN ISO 2160, 24 h, 100°C	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree
Steel corrosion, DIN ISO 7120 / ASTM D665, method A, 24 h, 60°C	rust-free	rust-free	rust-free	rust-free
Pour point, DIN ISO 3016	≤ -25 °C	≤ -25 °C	≤ -25 °C	≤ -25 °C
FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of cage	≤ 200 mg			

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FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of rolling elements	≤ 30 mg			
FZG scuffing test, DIN ISO 14635-1, A / 8.3 / 90, failure load stage	> 13	> 13	> 13	> 13
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	36 months	36 months	36 months	36 months

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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