

Klüberoil EE 1-46

Energy-efficient high-performance lubricating oil



Your benefits at a glance

- **High system and energy efficiency over a wide temperature range due to**
 - lower energy losses in plain bearings
 - optimised viscosity-temperature behaviour
- **Process optimisation**
 - Uninterrupted operation due to low foaming tendency
 - Good compatibility with plain bearing materials due to a carefully designed additive system
- **Meets DIN 51515-2 requirements for turbine oils**

Your requirements - our solution

As an operator or manufacturer of hydroelectric plants you are looking for possibilities to save energy and attain higher equipment efficiency. You wish to find new ways to reach your sustainability goals - lower costs and an improved energy balance - by straightforward measures without major redesigns.

To meet these very demanding requirements, we developed the energy-efficient plain bearing lubricant Klüberoil EE 1-46 in close cooperation with a leading European manufacturer of electric systems. Klüberoil EE 1-46 complies with the requirements for turbine oils laid down in DIN 51515-2 and shows a low foaming tendency and high oxidation stability.

The use of Klüberoil EE 1-46 enables the uninterrupted operation of your hydroelectric plant and offers simple and efficient cost savings due to

- a reduction of internal friction losses and hence higher efficiency
- long oil change intervals
- long component life being attained

Application

Klüberoil EE 1-46 was especially developed for the lubrication of plain bearings in hydroelectric plants. The additives used were selected to ensure compatibility with plain bearing materials.

Application notes

Klüberoil EE 1-46 is a semi-synthetic plain bearing oil based on mineral oil and polyalphaolefin. Due to its composition, Klüberoil EE 1-46 is compatible with oils based on mineral oil, synthetic hydrocarbons or ester.

Do you want to know the energy, related cost and CO₂ reductions you can obtain by exchanging the lubricant in your application? Do you need to prove your savings by measurements, e.g. for your energy audit acc. to ISO50001? KlüberEnergy Service can measure how your energy efficiency has improved in any application using state-of-the-art methods.

Talk to your Klüber sales engineer or our KlüberEnergy Service experts. We look forward to hearing from you.

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.

| Pack sizes | Klüberoil EE 1-46 |
|------------------|-------------------|
| Canister 20 l | + |
| Drum 200 l | + |
| Container 1000 l | + |



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Energy-efficient high-performance lubricating oil

| Product data | Klüberoil EE 1-46 |
|--|---------------------------------|
| Article number | 030044 |
| Chemical composition, type of oil | PAO |
| Chemical composition, type of oil | mineral oil |
| Colour space | yellow |
| ISO viscosity grade, DIN ISO 3448 | 46 |
| Density, based on DIN 51757) at 15 °C | approx. 0.863 g/cm ³ |
| Flash point, DIN EN ISO 2592, Cleveland, open-cup apparatus | >= 215 °C |
| Pour point, DIN ISO 3016 | <= -15 °C |
| Viscosity index, DIN ISO 2909 | >= 100 |
| Kinematic viscosity, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 40 °C | approx. 46 mm ² /s |
| Kinematic viscosity, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 100 °C | approx. 6.5 mm ² /s |
| Anticorrosive properties on steel, DIN ISO 7120, method A, steel, 24 h/60 °C | no rust corrosion degree |
| Air shedding capacity, DIN ISO 9120 (ASTM D 3427), at 50°C | <= 3 min |
| Copper corrosion, DIN EN ISO 2160, 3h/125°C | 1 - 125 corrosion degree |
| Lower service temperature | -15 °C / 5 °F |
| Upper service temperature | 80 °C / 176 °F |
| Foam test, ASTM-D 892, ISO 6247, sequence I/24 °C | <= 50/0 ml |
| Foam test, ASTM-D 892, ISO 6247, sequence II/ 93.5 °C | <= 50/0 ml |
| Foam test, ASTM D 892, ISO 6247, sequence III/24°C | <= 50/0 ml |
| Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx. | 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 80 years.

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