

RENOLIN

RENOLIN XtremeTemp High Performance Hydraulic Oil

**FUCHS
LUBRICANTS GERMANY
GmbH**

RENOLIN XtremeTemp

Viscosity grade (s)

32/46/68

Rating number

BR-1010-0047

Bosch Rexroth
Fluid Rating List
RDE 90245

Rated by **Bosch Rexroth**

MOVING YOUR WORLD

LUBRICANTS.
TECHNOLOGY.
PEOPLE.



FUCHS LUBRICANTS GERMANY

We do not just develop lubricants. We develop intelligent solutions for highly complex challenges.

To this end, we have pooled our expertise and experience from a wide range of application areas: FUCHS SCHMIERSTOFFE and FUCHS LUBRITECH became FUCHS LUBRICANTS GERMANY. Our goal: to keep our customers' world in motion. Efficient, sustainable, reliable. Today and tomorrow.

What can we move for you?



FUCHS LUBRICANTS GERMANY

Facts and figures

Company: FUCHS LUBRICANTS GERMANY GmbH,
a company of the FUCHS Group

Locations: Based in Mannheim, with sites in
Bremen, Dohna, Hamburg, Kaiserslautern, Kiel and Wedel; ap-
prox. 1,400 employees

Product range: A full range of more than 3,000 products
for all application areas

Certifications i. a.: ISO 9001, IATF 16949, ISO 14001,
ISO 45001, ISO 50001, ISO 21469, HALAL, KOSHER
(detailed certifications at www.fuchs.com/de/en)

CO₂ neutral production*

Since 1931, we have been pursuing the same goal: to keep the world moving. With innovative and technological lubricant solutions that have a sustainable impact on the future. Unconditional reliability is our top priority, it is the foundation of our company and basis for everything that defines us.

Reliability is both a driver and a demand. And it's a promise to all our customers in the fields of automotive suppliers and OEMs, mechanical engineering, metal processing, mining and exploration, aerospace, energy, construction and transport, agriculture and forestry, as well as the paper, steel, metal, cement, forging and food industries, but also qualified lubricant dealers, car dealerships and workshops.

Long-term experience, high development strength and the fulfillment of far-reaching standards are the basis for the special quality of our world-leading product brands. We deliver solutions that are simply more efficient and therefore more sustainable. We always think in holistic solutions. For the development of individual solutions, we enter into an intensive customer dialog with you. This is the way we live up to our claim of moving your world.

MOVING YOUR WORLD

*Partially also based on compensation

FUCHS SPECIAL HYDRAULIC OIL. MAXIMIZE THE EFFICIENCY – AND MINIMIZE THE COSTS.

Buzzwords such as fuel economy and energy saving are becoming more and more popular. In the light of this and in order to meet the special demands of a large construction machinery manufacturer, we have developed and successfully launched the new RENOLIN XtremeTemp hydraulic oil.

RENOLIN XtremeTemp significantly reduces fuel consumption while at the same time offering high efficiency, longer service life and thereby less maintenance and lower failure related downtimes as well as a broader operating temperature range.

RENOLIN XtremeTemp significantly reduces the operating costs of machinery such as earth-moving machines.

You can benefit from our experience, too!



RENOLIN XtremeTemp – higher efficiency, lower fuel consumption



13 %

Lower fuel consumption

(Comparison between conventional hydraulic oil and RENOLIN XtremeTemp)

Today, hydraulic systems, and in particular construction machinery and material handlers, often operate at full capacity (low tank volume, high circulation rates, high pressure, highest specific oil levels). In other words, today's hydraulic oils can often no longer reliably meet the requirements placed upon them. The demand for lower fuel consumption and the associated reduction of CO₂ emissions while maintaining the same level of performance can now only be met by using special hydraulic oils such as RENOLIN XtremeTemp.

Alongside the legal stipulations (exhaust emissions standards, emissions laws, environmental provisions), increased fuel costs make up a large proportion of operating costs. In comprehensive tests at test benches as well as in numerous field tests and practical applications at our customers, we have recorded fuel savings of approx. 5 – 20 % when using RENOLIN XtremeTemp.

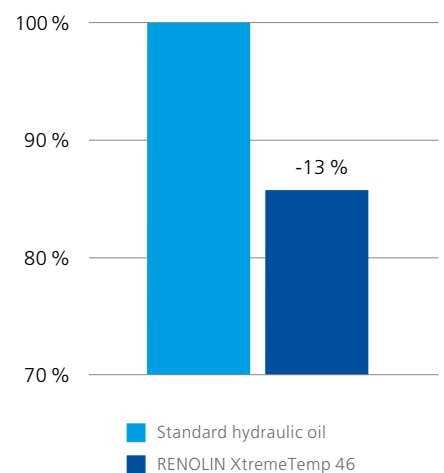
RENOLIN XtremeTemp sustainably reduces your operating costs

Alongside a number of other tests, nine days of field tests lasting several hours were carried out with a shovel excavator in which the machine was unloaded at 180° from a distance of 30 meters. This work cycle was constantly repeated. RENOLIN XtremeTemp 46 was compared with conventional hydraulic oil for this application.

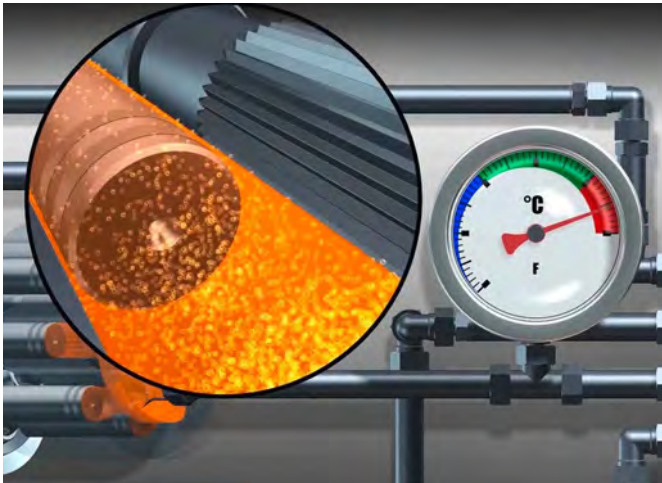
Field test:

At full load, the fuel consumption of the excavator was 20l per hour using conventional hydraulic oil. With RENOLIN XtremeTemp this figure dropped to just 17l per hour – a significant reduction.

Significantly reduced fuel consumption



Get off to a great start at any temperature with RENOLIN XtremeTemp



Better start-up behaviour at low temperature and better efficiency at high temperature due to optimized viscosity-temperature behaviour

(Comparison between conventional hydraulic oil and RENOLIN XtremeTemp)

Special viscometric properties

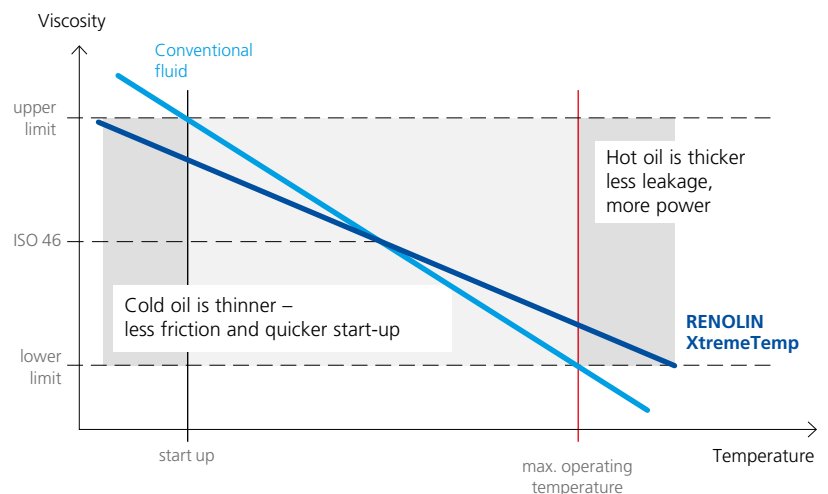
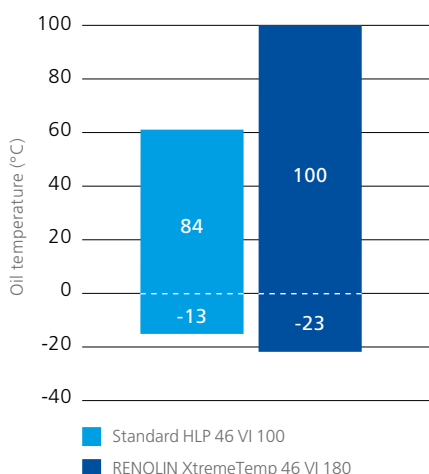
The improved properties of the oil include its efficient use at a wide range of temperatures, minimal friction loss at low temperatures, lower internal pumping losses and outstanding performance even in environments with high pressures and temperatures. RENOLIN XtremeTemp ensures a faster start and thereby offers a larger temperature window for an effective work process.

This in turn results in increased productivity, lower energy consumption per work cycle and thereby – sustainability being the key word here – lower CO₂ emissions, higher machine performance and longer service lives and oil change intervals. At the same time, it counteracts the danger of overheating and system failure and thereby contributes to reducing costs for users.

Temperature window – based on the requirements:

Start: max. 1,000 mm²/s

Working: min. 10 mm²/s



Superb results – even under extreme conditions



65 %

Less wear

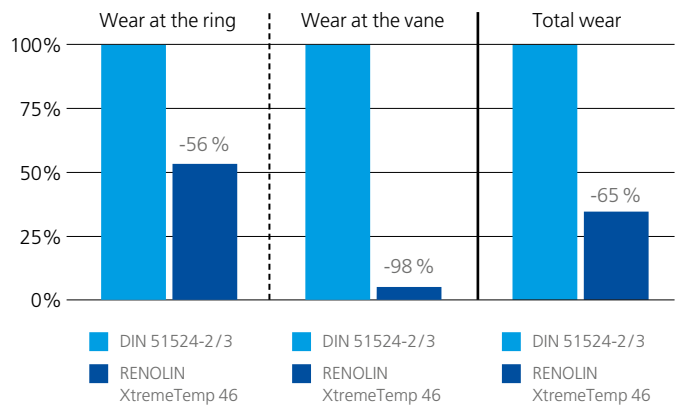
(Comparison between conventional hydraulic oil and RENOLIN XtremeTemp)

Field test exceeds expectations

In the past, the ever-tougher demands placed on modern hydraulic systems resulted in increasingly frequent damage to the hydraulic pumps. However in common pump tests the use of RENOLIN XtremeTemp 46 produced less wear in comparison to conventional hydraulic oils.

And what's more, a range of practical examples from the field prove that the oil isn't just a success under the ideal conditions at the test bench.

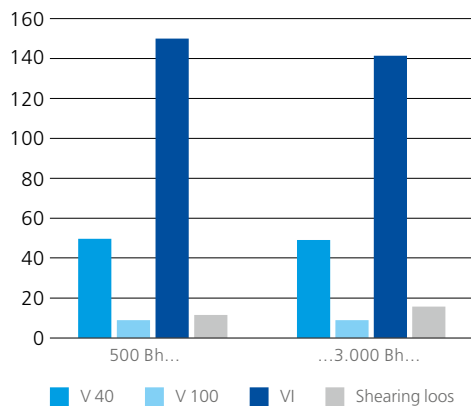
Vickers Vane Pump Test V104C



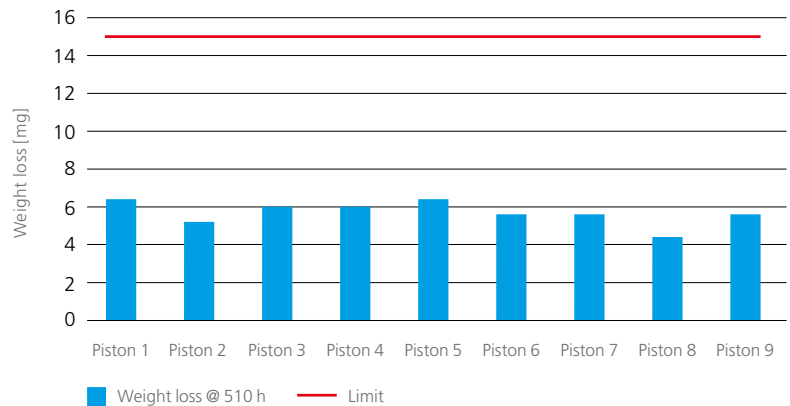
Field test:

Viscosity – RENOLIN XtremeTemp 46

Temperatures up to 40°C and up to 100% air humidity



Motor piston weight loss after 510 hours



Longer service life, extended change intervals



400 %

Longer service life

(Comparison between conventional hydraulic oil and RENOLIN XtremeTemp)

When used in mining excavators and at high temperatures and humidity, RENOLIN XtremeTemp achieved an oil change interval of over 10,000 oil operating hours. This represents a fourfold increase in service life compared to the standard oil used previously.

During a field trial in Finland, a mining excavator has been operated for 11000 operating hours without performing an oil change. In the frequently performed oil analysis, no significant fluid ageing was detected. Also viscosity values stayed on a stable level.

FES rolls in-house test – Reduced sludge, reduced varnish.
Aging over 168h / 135°C in a beaker glass with metal roller

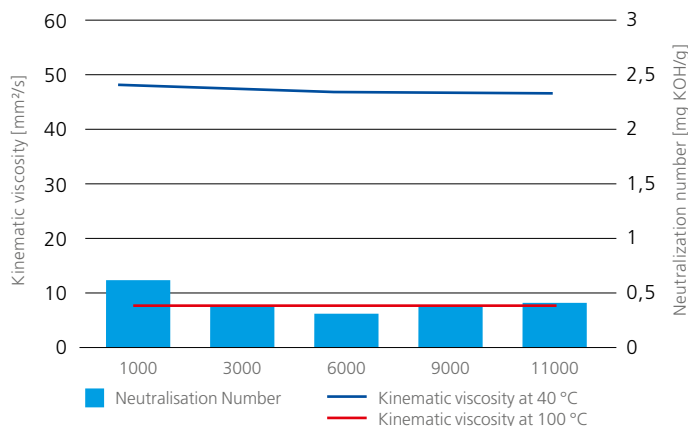


Conventional hydraulic oil, ISO VG 46



High performance, RENOLIN XtremeTemp 46

Field test:
More than 11000 operating hours without oil change



Work efficiently with RENOLIN XtremeTemp



7 %

Increase in productivity in earth-moving work

(Comparison between conventional
hydraulic oil and RENOLIN XtremeTemp)

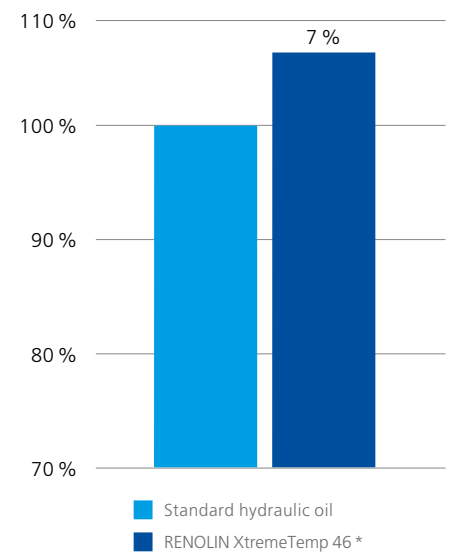
When used in a track excavator for over 4000 working hours with a hydraulic system volume of 255 liters, it quickly became apparent that the higher price of RENOLIN XtremeTemp 46 is outweighed by numerous advantages:

- 7% increase in productivity. By using RENOLIN XtremeTemp it was possible to move more earth during the same period, or the time required to move the same amount of earth was reduced.



FUCH hydraulic oils
RENOLIN XtremeTemp in action.
Here you can find the video.

Productivity (tons of material per hour)



* RENOLIN XtremeTemp 46 is specified in line with DIN 51 524-3 and ISO 11158-HV and fulfills / exceeds their requirements.

RENOLIN XtremeTemp-range Products you can count on

AW – circulating and hydraulic oils with a high viscosity index, high shear stability and extremely good air release properties

The products of the RENOLIN XtremeTemp range were developed as extremely shear-resistant multigrade hydraulic oils for applications in the field of mobile hydraulics. Moreover, they can also be successfully used in stationary hydraulic systems that are exposed to changing ambient temperatures. The RENOLIN XtremeTemp range is based on special base oils, giving them outstanding low-temperature properties.



Application recommendation

Universally deployable multigrade hydraulic oil based on partially special base oils, HVLP hydraulic oils; for stationary and mobile systems.

Specifications

- Excellent shear stability and high viscosity index
- Excellent low temperature properties
- Excellent air release properties
- Semi-synthetic base oils, high additive reserve
- High protection against wear and corrosion

Advantages and Benefits

- Low dependence of viscosity on temperature, very good low-temperature properties
- Good cold flow properties, low starting viscosity, avoidance of cavitation
- Minimal air absorption, rapid release of dragged-in air, avoidance of cavitation and wear
- High aging and temperature resistance, excellent performance, long service life, extended change intervals
- Universally deployable hydraulic oil with high wear protection capacity, extends service life of components, extended oil change intervals

Typical properties

| Product name | RENOLIN Xtreme Temp | | | | | Test method |
|--|---------------------|---------|------|------|------|-----------------|
| | 32 | 46 | 68* | 100* | | |
| Properties | Unit | | | | | |
| ISO VG | | 32 | 46 | 68 | 100 | |
| Kinematic viscosity at -20 °C | mm ² /s | 1000 | 2040 | 4800 | 9000 | DIN EN ISO 3104 |
| at 0 °C | mm ² /s | 220 | 400 | 660 | 1100 | |
| at 40 °C | mm ² /s | 32 | 48 | 70 | 100 | |
| at 100 °C | mm ² /s | 6.9 | 9.3 | 11.8 | 14.5 | |
| Viscosity index | - | 180 | 180 | 165 | 150 | DIN ISO 2909 |
| Density at 15 °C | kg/m ³ | 845 | 853 | 856 | 863 | DIN 51757 |
| Flash point in open cup acc. to Cleveland | °C | 216 | 230 | 254 | 250 | DIN ISO 2592 |
| Pourpoint | °C | -45 | -42 | -39 | -36 | DIN ISO 3016 |
| Neutralisation number | mgKOH/g | 0.5 | 0.5 | 0.5 | 0.5 | DIN 51558 |
| FZG A/8.3/90 | failure load stage | 11 | 11 | 11 | 11 | DIN ISO 14635-1 |
| VKA shear stability, four-ball-test: relative shear loss after 20 h | % | < 10 | < 10 | < 10 | < 10 | DIN 51350-6 |
| TOST Lifetime (type value) | h | > 8,000 | | | | ASTM D 943 |
| Foaming, Seq. I: 24 °C | ml | 30/0 | 20/0 | 0/0 | 0/0 | ASTM D 892 |
| Seq. II: 93,5 °C | ml | 20/0 | 10/0 | 10/0 | 20/0 | |
| Seq. III: 24°C nach 93.5 °C | ml | 30/0 | 20/0 | 0/0 | 0/0 | |
| Air release at 50 °C | min | 4 | 5 | 5 | - | DIN ISO 9120 |
| Corrosion protection – steel | degree of corrosion | 0-A | 0-A | 0-A | 0-A | DIN ISO 7120 |
| | degree of corrosion | 0-B | 0-B | 0-B | 0-B | |

* available upon request

RENOLIN XtremeTemp-range in comparison

| Product name | Viscosity index | Shear stability in tapered roller bearing (VKA – 20h) | Viscosity at – 20 °C (mm ² /s) | Pour point °C | Specifications |
|----------------------------------|--|---|--|---|---|
| RENOLIN XtremeTemp 32 | > 180 (multigrade hydraulic oil). Low temperature/ viscosity dependency | < 10% Shear loss High shear resistance | 1000 (very good cold flow properties) | -45 (very good low tem- perature behavior) | DIN 51524-3: HVLP ISO 6743-4: HV Bosch Rexroth RDE 90245 Denison HF-0 |
| RENOLIN XtremeTemp 46 | | | 2040 (very good cold flow properties) | -42 (very good low temperature behavior) | |

RENOLIN XtremeTemp – For the sake of the environment

RENOLIN XtremeTemp can make a major contribution regarding sustainability. Together with BASF SE, FUCHS Lubricants Germany GmbH performed a TÜV-certified LCA study. The whole life cycle – from raw material extraction to production of the lubricants to the disposal of lubricants – of three different hydraulic oil qualities has been compared. The result is a premium hydraulic oil like RENOLIN XtremeTemp, creates more CO₂ during production. But this can easily be compensated during the using phase by reduction of fuel consumption and extended oil change intervals of the equipment.

You can find further information about this topic in our FUCHS magazine Evolve:



Additionally, we have developed a calculator where you can calculate your CO₂ savings and the return of invest by using RENOLIN XtremeTemp. There are also animations to understand the background of the improvement regarding better hydraulic efficiency:







Notes

Disclaimer:

The information contained in this product information is based on the experience and know-how of FUCHS Lubricants Germany GmbH in the development and manufacturing of lubricants and represents the current state-of-the-art. The performance of our products can be influenced by a series of factors, especially the specific use, the method of application, the operational environment, component pre-treatment, possible external contamination, etc. For this reason, universally-valid statements about the function of our products are not possible. Our products must not be used in aircrafts / spacecrafts or their components, unless such products are removed before the components are assembled into the aircraft / spacecraft. The information given in this product information represents general, non-binding guidelines. No warranty expressed or implied is given concerning the properties of the product or its suitability for any given application.

We therefore recommend that you consult a FUCHS Lubricants Germany GmbH application engineer to discuss application conditions and the performance criteria of the products before the product is used. It is the responsibility of the user to test the functional suitability of the product and to use it with the corresponding care.

Our products undergo continuous improvement. We therefore retain the right to change our product program, the products, and their manufacturing processes as well as all details of our product information sheets at any time and without warning, unless otherwise provided in customer-specific agreements. With the publication of this product information, all previous editions cease to be valid.

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FUCHS Industrial lubricants

Innovative lubricants need experienced application engineers

Every lubricant change should be preceded by expert consultation on the application in question. Only then can the best lubricant system be selected. Experienced FUCHS engineers will be glad to advise on products for the application in question and also on our full range of lubricants.

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