

FUCHS Industrial Lubricants

**RENOLIN**

**A product for every application**



**Specialties for the  
hydraulic fluid sector**



FUCHS EUROPE SCHMIERSTOFFE GMBH

# YOUR STRONG GLOBAL PARTNER



## HOW WE EXCEL

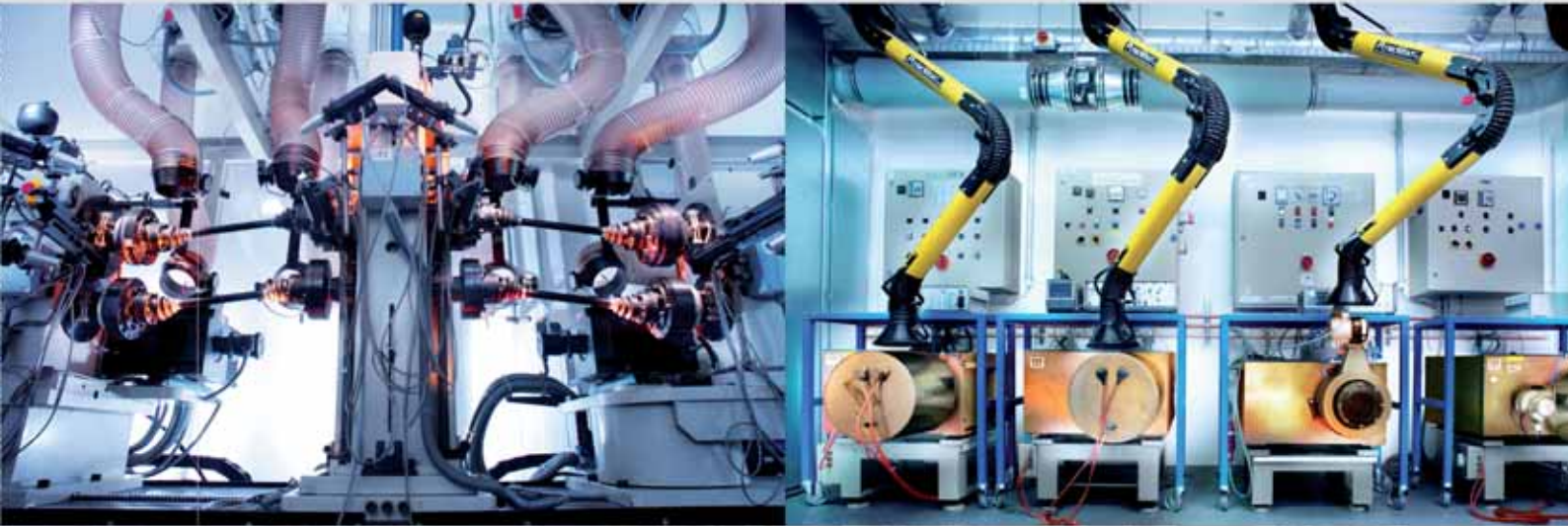
We are a German company whose almost 600 employees manufacture and market a wide range of lubricants and derived specialties. The company, which was founded in 1931 as RUDOLF FUCHS, is located in Mannheim and is a 100 % subsidiary of FUCHS PETROLUB AG, which is the largest independent lubricants manufacturer worldwide.

Our company's degree of specialisation and innovation is way above the industrial average in this field. The full product line includes almost 2,000 lubricants and derived specialties for all walks of life, industrial processes and applications. Our customer's success is also our success. Because partnership to us means passing-on benefits.

The advantage of a strong market presence: FUCHS is the largest independent manufacturer of lubricants in the world. The benefit of premium, innovative products from a full-line manufacturer: With a complete product line as well as tailor-made special solutions, FUCHS has a product for every application. The benefits of reliability: Certified according to DIN EN ISO 9001:2000 and ISO/TS 16949:2002, FUCHS has been continuously upgrading its highly specialised lubricants for decades.

And naturally, partnership for us also means providing our customers with competent support. With comprehensive marketing. With high-performance logistics. With the development of successful service concepts. And qualified consulting. Because together, we can achieve more.

# FOR INDUSTRIAL LUBRICANTS



## WHAT INCREASES THE VALUE OF OUR PRODUCTS

We develop lubricants: application-specific and tailor-made for our customer's processes. Together we look for the best lubricants for our customers. This cooperation is unique in terms of its form, scope and intensity. We call it **development partnership**. The success of our development partnerships is based on an important fact: FUCHS is not one of the oil-giants.

FUCHS is a multinational, independent lubricant manufacturer. Our independence is the difference. We are open to new solutions, open for visions – the prerequisites for innovations. And innovation is the defining characteristic of FUCHS. 70 % of our products are less than five years old and the great majority of our products are individual solutions. Challenge us and see!



DIN EN ISO 9001:2000  
ISO/TS 16949:2002  
DIN EN ISO 14001:2004  
REG.NR. 2476





# RENOLIN UNISYN OL SERIES

**Fully-synthetic, high-performance hydraulic fluids and air compressor oils**



The RENOLIN UNISYN OL SERIES of oils are fully-synthetic hydraulic fluids based on polyalphaolefins (PAO) which are also used as synthetic compressor oils. As a result of their chemical structure, RENOLIN UNISYN OL SERIES products have a naturally high and shear-stable Viscosity Index (VI >140) and thus display multigrade characteristics. They also offer excellent cold flowing properties.

As a result of the interaction between the special synthetic oils and the additives and as opposed to conventional mineral oils, the RENOLIN UNISYN OL SERIES offer outstanding oxidative and thermal stability so that oil change intervals can be extended and the formation of ageing-related by-products minimized. In addition, the oils display an extremely low evaporation tendency as well as very good wear protection. All the products offered extreme rapid air release and low foaming

Recommended applications	Technical properties	Advantages and benefits
As universal, fully-synthetic, low-temperature hydraulic oils or synthetic (VDL) compressor oils. For the use in stationary and mobile hydraulic systems.	Very high oxidative and thermal stability	Minimal coking, few ageing-related by-products, long service life, significantly extended oil change intervals
	Excellent low-temperature behaviour	Low viscosity at low temperatures while maintaining high operating viscosity
	Excellent wear and corrosion protection	Extends the service life of machinery, protects against wear
	Good demulsification	Water is rapidly and reliably separated; prolongs service life
	Compatible with elastomers	Seals and gaskets are protected
	Excellent air release	Air is released rapidly, cavitation is avoided and the service life of pumps and valves is prolonged

## Selected technical data

Product name	Viscosity Index (VI)	Shearing losses in the tapered roller bearing test, VKA apparatus – 20 h	Pourpoint (°C)	Air release (min.)	Scuffing wear test FZG A/8.3/90 (damage load stage)	Roller bearing wear test FE8, 7.5/80/80 (mg total wear)
<b>RENOLIN UNISYN OL 32</b>	142	no shearing losses	< -60	1	> 12 – high protection	< 10 – no wear
<b>RENOLIN UNISYN OL 46</b>	146	no shearing losses	< -60	2	> 12 – high protection	< 10 – no wear
<b>RENOLIN UNISYN OL 68</b>	144	no shearing losses	< -60	5	> 12 – high protection	< 10 – no wear

Also available as RENOLIN UNISYN OL 100 and 150.

While the information and figures given here are typical of current production and confirm to specification, minor variations may occur. Subject to amendment. Edition 07/2008

## RENOLIN MRX SERIES

### Multifunctional hydraulic oils with increased corrosion protection



The RENOLIN MRX SERIES of multifunctional oils are hydraulic oils with a high percentage of additives and excellent corrosion protection. These oils can also be used as universal lubricating and hydraulic fluids. High additive reserves allow oil change and service intervals to be extended. This allows machine availability and manufacturing capacity to be increased.

RENOLIN MRX products provide excellent corrosion protection: Steel, iron and nonferrous metals are reliably protected against corrosion even in the harshest of conditions. Detergent additives combat sludge formation and assist the formation of a lubricating film by improving wetting.

Recommended applications	Technical properties	Advantages and benefits
General lubricating and hydraulic systems which require increased corrosion protection.	Special corrosion protection additives	Reliably protects steel, iron and nonferrous metals against corrosion
	High additive reserves	Extends oil change and service intervals
	Powerful detergent properties	Combats the formation of sludge, no malfunctions
	Very good wetting properties	Stable lubricating film protects against wear also under severe conditions

#### Selected technical data

Product name	Detergency/ dispersancy	Corrosion protection – copper	Corrosion protection – steel	Corrosion protection – steel humidity cabinet	Corrosion protection – steel condensation climate	Sea water submersion test
<b>RENOLIN MRX 32</b>	high	high 1-100 A 48	0 – A	> 168 h	> 12 cycles	0 on 6
<b>RENOLIN MRX 46</b>			0 – B	without	without	without
<b>RENOLIN MRX 86</b>			no corrosion	corrosion	corrosion	corrosion

# RENOLIN LIFT SERIES

## Friction-reducing special hydraulic oils for “stick-slip”-free hydraulics



RENOLIN LIFT products are used as friction-reducing special hydraulic oils in elevators and transport mechanisms in the stationary and mobile hydraulic sector.

Exact positioning is of vital importance in elevator and transport technology. However, very low sliding speeds and high loads in hydraulic systems and cylinders can cause stick-slip. This interferes with precise movement in hydraulic systems. These conditions can cause the load-bearing

lubricating film to tear and cause stick-slip. Stick-slip leads to increased wear in machinery, on pistons and in seals.

The pressure-stable lubricating film formed by RENOLIN LIFT combats stick-slip and protects against wear. In addition, the products offer good ageing stability, reliable corrosion protection and outstanding detergent and dispersant properties.

Recommended applications	Technical properties	Advantages and benefits
Elevators, hydraulic transport mechanisms, stationary and mobile hydraulics.	Excellent wetting, avoids frictional vibration	Formation of a pressure-stable lubricating film and avoidance of stick-slip and wear
	Form stable lubricating films	Extremely low coefficient of friction
	Good wear protection (high additive reserves)	Maintains machine availability (less down time) and avoids wear
	Good ageing stability	Long oil life, combats sludge formation
	Outstanding detergent and dispersant properties	Fights the formation of contaminants and ageing by-products

### Selected technical data

Product name	Stick-slip frictional vibration	Coefficient of friction SKC test (steel-plastic)	Scuffing wear test FZG A/8.3/90 (damage load stage)	Corrosion protection – steel
RENOLIN LIFT 22	none	0.13 (minimal)	12 – high protection	0 – A
RENOLIN LIFT 32	none	0.13 (minimal)	12 – high protection	0 – B
RENOLIN LIFT 46	none	0.13 (minimal)	12 – high protection	no corrosion



## RENOLIN ANTI-STICK-SLIP

### Universal anti-stick-slip additive for hydraulic fluids



RENOLIN ANTI-STICK-SLIP is a specially-developed, hydraulic fluid additive package to reduce stick-slip in hydraulic elevators, cylinders as well as stationary and mobile hydraulic systems. Low sliding speeds and high loads in hydraulic systems can cause stick-slip. This interferes with precise movement in hydraulic systems and can cause the lubricating film to tear and generate excessive wear.

The addition of just 2% RENOLIN ANTI-STICK-SLIP to a hydraulic oil significantly reduces the dangers of stick-slip. This universally-applicable anti-stick-slip additive is readily miscible and is compatible with mineral oil-based hydraulic oils (containing zinc or zinc- and ash-free) as well as hydraulic oils based on hydrated base oils and synthetic hydraulic oils based on polyalphaolefins (PAO). RENOLIN ANTI-STICK-SLIP is simple to use.

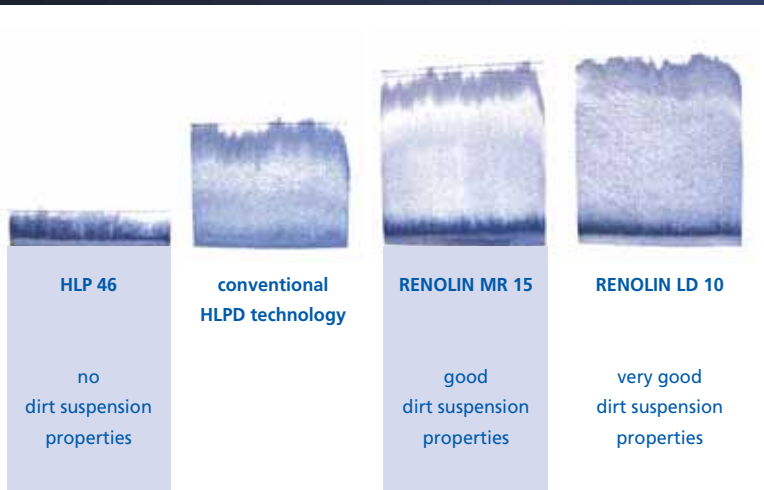
Recommended applications	Technical properties	Advantages and benefits
An universal additive system for all kind of hydraulic system, for hydraulic oils based on mineral oil, for hydrated base oils or for synthetic base oils (PAO).	Universally-applicable	Suitable for all hydraulic systems, good compatibility with hydraulic oils
	Excellent wetting, combats stick-slip	Stick-slip is avoided, seals and elastomers are protected
	Forms a stable lubricating film	Extremely low coefficient of friction, reduces wear
	Simple to use	No time-consuming oil changes necessary, simply add 2% additive concentrate to the hydraulic oil

### Selected technical data

Product name	Viscosity at +40 °C (mm <sup>2</sup> /s)	Recommended concentration in mineral oil-based hydraulic oil and PAO	Miscibility and compatibility with Zn and/or Zn – free based hydraulic fluids (mineral oil-based)	Compatibility with hydraulic components, sealing material, paint
RENOLIN ANTI-STICK-SLIP	68	approx. 2%	very good	very good

# RENOLIN LD 10

## Functional fluid with outstanding cleaning performance



This fluid containing specially-refined base oils and selected additives is used in general lubricating and hydraulic circuits as a functional fluid with special cleaning and flushing properties. RENOLIN LD 10 is the perfect product to dislodge and suspend impurities in hydraulic systems and thus avoid malfunctions.

The special additives in RENOLIN LD 10 can dislodge impurities on control elements and valves while the system is in operation and transport them to the system filters.

The most important features of this oil are its powerful cleaning effect, good ageing stability along with its outstanding sludge and dirt transportation properties. Further-more, it offers long-term protection against corrosion and wear.

This oil forms a stable lubricating film which allows machines to be operated as usual during flushing.

Recommended applications	Technical properties	Advantages and benefits
For cleaning and flushing procedures in lubrication systems and in hydraulic systems, cleaning during the system is in operation.	Outstanding cleaning performance	Combats and avoids the gumming of control mechanisms
	Excellent sludge and dirt suspension properties	Deposit of ageing by-products is avoided, combats valve malfunctions
	Very good wetting	Forms a stable lubricating film; low wear
	Good corrosion and wear-protection properties	Longer machine life
	Can be used as a hydraulic oil during flushing and functional testing	Machine down-time is eliminated
	High additive reserves	Protects machinery against corrosion and wear during cleaning

### Selected technical data

Product name	Viscosity at +40°C (mm²/s)	Brugger wear protection (N/mm²)	Compatibility with mineral oil-based hydraulic oils	Detergent/dispersant properties, cleaning properties
<b>RENOLIN LD 10</b>	46	> 35 = high protection	very good	very high



## RENOLIN HLP 46 ALU

**EP/AW “non-staining hydraulic fluid” to avoid stains and residues on aluminium surfaces**



The special hydraulic oil RENOLIN HLP 46 ALU (special base oil, special additives) was developed for use in hydraulic systems used in aluminium rolling mills and displays excellent aluminium compatibility.

During the aluminium manufacturing process, some cross-contamination of hydraulic and aluminium rolling oils can occur. This can lead to undesirable staining of the hot aluminium surfaces.

However, the carefully-selected base oils and special EP/AW additives in RENOLIN HLP 46 ALU combat such staining (non-staining properties). In addition, RENOLIN HLP 46 ALU offers excellent protection against wear and can be used as a fully-functional hydraulic oil.

Recommended applications	Technical properties	Advantages and benefits
Hydraulic systems in aluminium rolling mills. Universal lubricating and hydraulic fluid in the aluminium industry.	Specially selected synthetic base oils and additives	Non-staining when evaporates on aluminium surfaces
	Good wear protection, FZG 10	Extended machinery and plant life
	Excellent ageing stability	Long oil service life
	Very low foaming	No detrimental effect on the formation of the lubricating film
	In general good compatibility with aluminium rolling oils	No detrimental effect on the rolling oil or aluminium surfaces

### Selected technical data

Product name	Scuffing wear test FZG A/8.3/90 (damage load stage)	Residue formation on hot aluminium surfaces	Fulfils and surpasses HLP requirements: DIN 51524-2
RENOLIN HLP 46 ALU	10 – high protection	no residues	yes

# RENOLIN DO 22 HV

**Special hydraulic oil containing selected base oils with an extremely high Viscosity Index**



Hydraulic applications subject to very low temperatures or highly-fluctuating temperatures require oils with a high Viscosity Index to achieve good viscosity-temperature behaviour (little temperature-related changes to viscosity).

To perform reliably in such conditions, RENOLIN DO 22 HV was developed based on high-quality synthetic base oils in combination with special additives and polymers (VI-improvers).

These polymers display excellent shear stability and offer very good cold-flowing properties.

RENOLIN DO 22 HV is a friction-reducing, multigrade hydraulic oil which is suitable for use in a very wide range of temperatures.

Recommended applications	Technical properties	Advantages and benefits
Mobile and stationary systems such as cold stores, applicable in artic door-closing mechanisms, for all kind of low temperature applications.	Very high Viscosity Index (VI = 359)	Extremely good viscosity-temperature behaviour, pronounced multigrade characteristics
	Excellent low-temperature behaviour	Extremely low viscosity at low temperatures while maintaining high operating viscosity
	High percentage of synthetic base oils	High ageing stability, very good low-temperature flowability, long life
	High percentage of detergents, friction-reducing	Combat sludging, low coefficients of friction protect hydraulic components against wear

## Selected technical data

Product name	Viscosity at -40°C [mm <sup>2</sup> /s]	Pourpoint (°C)	Viscosity index (VI)	Brugger wear protection (N/mm <sup>2</sup> )	Scuffing wear test FZG A/8.3/90 (damage load stage)
<b>RENOLIN DO 22 HV</b>	1252 (very good low-temperature flowability)	-48 (very good low-temperature behaviour)	359 (very high) multigrade hydraulic fluid	> 35 = high protection	12 = high

## RENOLIN Xtreme Temp SERIES

**AW general and hydraulic oils with a high Viscosity Index, high shear stability and extremely good air release**



RENOLIN Xtreme Temp SERIES products were developed as innovative, shear-stable, multigrade hydraulic oils for all mobile applications. They can also be used in stationary hydraulic applications which are subject to fluctuating ambient temperatures.

RENOLIN Xtreme Temp products contain specially hydrated base oils and thus display excellent low-temperature characteristics. They all have a low start-up viscosity which avoids inlet-side pressure losses and prevents cavitation. The optimum formulation of this series offers excellent air release.

This feature significantly reduces oil-borne air in comparison to mineral oil-based products.

RENOLIN Xtreme Temp products display excellent shear stability and a high Viscosity Index. They also offer long life. The use of RENOLIN Xtreme Temp products increase mechanical efficiency and reduce energy consumption. Compared to conventional hydraulic oils, energy savings of 5-8 % are possible.

Recommended applications	Technical properties	Advantages and benefits
Universally-applicable, multigrade hydraulic oils containing semi-synthetic base oils. HVLP hydraulic oils for stationary and mobile hydraulic systems.	Excellent shear stability and high Viscosity Index	Minimal temperature-related fluctuations in viscosity, good low-temperature behaviour while maintaining high operating viscosity
	Excellent low-temperature characteristics	Good cold-flowing properties, low viscosity, combats cavitation
	Excellent air release	Minimal air absorption, rapid release of dragged-in air
	Semi-synthetic base oils, high additive reserves	Good ageing stability, excellent performance, long life
	Good protection against wear and corrosion	Universally-applicable hydraulic oils with high wear-protection reserves

### Selected technical data

Product name	Viscosity Index (VI)	Shearing stability: VKA apparatus – 20 h tapered roller bearing shear test	Viscosity at -20°C (mm <sup>2</sup> /s)	Pourpoint (°C)
<b>RENOLIN Xtreme Temp 32</b>	> 180 (high)	shear stable: < 10%	1186 (very good low-temperature flowability)	-36 (very good low-temperature behaviour)
<b>RENOLIN Xtreme Temp 46</b>	multigrade hydraulic oil	DIN 51350-6	2384 (very good low-temperature flowability)	-34 (very good low-temperature behaviour)



**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.



Contact:



### **FUCHS EUROPE SCHMIERSTOFFE GMBH**

Friesenheimer Straße 15  
68169 Mannheim / Germany  
Phone: +49 621 3701-0  
Fax: +49 621 3701-570  
E-mail: [zentrale@fuchs-europe.de](mailto:zentrale@fuchs-europe.de)  
[www.fuchs-europe.de](http://www.fuchs-europe.de)

Export Division  
Friesenheimer Straße 9  
68169 Mannheim / Germany  
Phone: +49 621 3701-703  
Fax: +49 621 3701-719