

FUCHS Industrial Lubricants

**RENOLIN**

## A Complete Product Line



## Hydraulic oils

LUBRICANTS.  
TECHNOLOGY.  
PEOPLE.



# OUR LUBRICANTS KEEP THE WORLD MOVING

For over 80 years now, Fuchs has focused all our activities and research expertise on the development of innovative lubricants.

This specialization has resulted in our company growing continuously, not only geographically but also technically and in terms of application areas.

Today, FUCHS is a globally-active, German company synonymous for high-performance lubricants and related specialties for nearly all fields of application and industries.





#### What sets our products apart.

We develop application-specific lubricants specifically for our partner's processes. Together with our customers, we strive to create perfect lubricant solutions. This co-operation we term a "development partnership" and Fuchs brings the expertise associated with being the world's largest independent lubricant company. Our independence is important, it means we are open to new. We are open to new approaches, open to new visions – the prerequisites for innovation. And innovations are a hallmark of FUCHS.

Together, we can achieve more.

## Summary of the various hydraulic oil categories.

Hydraulic fluids – RENOLIN				
Additive systems, containing Zn			Additive systems, Zn-free (ZAF) P/S technology	
Group I base oil	Group III base oil	Synthetic base oil	Group I base oil	Group III base oil
RENOLIN B 15 VG 46 demulsifying, separate water quickly	RENOLIN MR 46 MC high detergency/ dispersancy	PLANTOSYN 3268 (saturated ester – HEES)	RENOLIN ZAF B 46 HT demulsifying, high temperature, separate water quickly	RENOLIN ZAF 46 MC demulsifying, high temperature, separate water quickly
RENOLIN D 15 VG 46 detergency/ dispersancy properties	RENOLIN Xtreme Temp 46 „high energy efficiency“	RENOLIN UNISYN OL 46 (polyalphaolefin – PAO)	RENOLIN ZAF 46 D detergency/ dispersancy properties	
RENOLIN MR 15 VG 46 high detergency/ dispersancy	RENOLIN Xtreme Temp Plus „high energy efficiency – low friction“	RENOLIN PG 46 (polyglycol – PAG)	RENOLIN ZAF 46 DT high detergency/ dispersancy, high Brugger value	
RENOLIN Lift 46 „low friction“, anti stick-slip		RENOSAFE FIRE PROTECT 46 (synthetic ester – HFDU)	RENOLIN MWB 46 high detergency/ dispersancy, high Brugger value	
RENOLIN MRX 46 „higher corrosion protection“		HYDROTHERM 46 M (water/glycol – HFC)	RENOLIN High Press 46 DLC detergency/ dispersancy properties, Brugger value, „Oertlinghaus“	

**Example:** ISO VG 46, kinematic viscosity 46 mm<sup>2</sup>/s at 40 °C



# We combine technology with ecology.

## Fire-resistant hydraulic fluids.

HYDROTHERM 46 M is a proven water-glycol fluid which complies with the 7th Luxembourg Report and has been approved by a host of component manufacturers. It offers an extraordinarily long service life, extremely good wear protection and high chemical stability.

The PLANTOFLUX AT-S series of HFDU fluids based on selected carbonic acid esters is approved by Factory Mutual in the USA and is used with great success in the iron, steel and aluminum industries. RENOSAFE FIRE PROTECT was developed and tested on the basis of these experiences and has already been used successfully as a high-performance alternative.

The fire-resistant hydraulic fluid range is rounded off with RENOSAFE TURBO 46 DR (phosphoric acid ester) and the water-based HFAE- and HFAS-SOLCENIC products which are used in mining applications.

## Quickly biodegradable hydraulic fluids

As one of the pioneers in the area of rapidly biodegradable fluids, we have a comprehensive product range including:

- PLANTOHYD based on partially saturated esters,
- PLANTOSYN based on saturated esters,
- PLANTOHYD S-NWG – non-water-polluting products and
- PLANTOLUBE POLAR – low-temperature synthetic ester oils.

Furthermore, with PLANTOSYN HVI we are one of the first companies to offer products awarded with the EU Ecolabel ("Marguerite") and thereby combine the stringent European environmental protection requirements and conservation of resources with the highest level of technical performance.

## RENOLIN Hydraulic oils – containing zinc

Name	Corrosion protection	Ageing stability	EP/AW Antiwear additives	Demulsifying	Detergent	Highly dispersant	High VI
RENOLIN B	●	●	●	●			
RENOLIN B-HVI	●	●	●	●			●
RENOLIN XtremeTemp/Plus	●	● !!!	●	●			● !
RENOLIN D	●	●	●				
RENOLIN MR	● !	● !	●		●	●	
RENOLIN MR 310/520	● !	● !	●		●	●	● !
RENOLIN MR-MC	● !	● !!!	●		●	●	● !
RENOLIN LD	●	●	●		●	● !	

## RENOLIN Hydraulic oils – zinc-free and ash-free

Name	Corrosion protection	Ageing stability	EP/AW Antiwear additives	Demulsifying	Detergent	Highly dispersant	High VI
RENOLIN DTA	●	●		●			
RENOLIN ZAF-B	●	●	●	●			
RENOLIN ZAF-D	●	●	●		●		
RENOLIN MWB	●	● !	● !!! 1), 2)		●	● !	
RENOLIN ZAF-DT	●	● !	● !		●	● !	
RENOLIN ZAF-MC	●	● !!!	●	●			● !
RENOLIN ZAF B-HT	●	● !	●	●			
RENOLIN HighPress	●	●	● !		●	●	

! = Dominant characteristic (special additive reserves) 1) = Bruggen Anti-Wear > 50 Nmm<sup>2</sup> 2) = FE8-Roller Bearing Wear test = pass, excellent

# Specialties for the specialist – an overview.

## RENOLIN DTA – demulsifying circulating, spindle and hydraulic oils



HL/CL oils (demulsifying)

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN DTA 2</b>	Spindle, hydraulic and lubricating oils (machine oils) on the basis of selected base oils with additives for improved aging properties and corrosion protection. All RENOLIN DTA products are DIN 51 524-1 (HL) hydraulic oils and DIN 51 517-2 (CL) circulating oils based on mineral oil, demulsifying (water-repellent) and free of zinc. ISO 6743/4, HL, ISO 6743-6 and ISO 12925-1: CKB.	805	100	2.2	–	–	-27	For thermally-stressed bearings and hydraulic systems with peak temperatures of approx. 120°C. General lubrication without specific wear protection requirements (without AW/EP).  (Refer to PI* 4-1292 for further details)
<b>RENOLIN DTA 5</b>		837	120	4.6	1.6	106	-40	
<b>RENOLIN DTA 7</b>		843	153	7.4	2.2	92	-24	
<b>RENOLIN DTA 10</b>		851	174	10	2.6	92	-27	
<b>RENOLIN DTA 15</b>		856	195	15	3.4	98	-27	
<b>RENOLIN DTA 22</b>		865	210	22	4.2	94	-27	
<b>RENOLIN DTA 32</b>		874	222	32	5.4	102	-24	
<b>RENOLIN DTA 46</b>		874	228	46	6.8	101	-24	
<b>RENOLIN DTA 68</b>		882	250	68	8.7	99	-18	
<b>RENOLIN DTA 100</b>		881	248	100	11.2	97	-18	
<b>RENOLIN DTA 150</b>		889	266	150	15.5	94	-15	
<b>RENOLIN DTA 220</b>		893	280	220	18.8	95	-12	
<b>RENOLIN DTA 320</b>		898	280	320	24.0	95	-12	
<b>RENOLIN DTA 460</b>		904	315	460	30.4	95	-12	
<b>RENOLIN DTA 680</b>		913	302	680	37.9	92	-12	

## RENOLIN B – high-performance demulsifying AW/EP hydraulic and circulating oils, Denison HF0 approved



HLP oils (demulsifying)

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN B 3 VG 10</b>	General lubricating and hydraulic oils with good aging resistance and additives for improved corrosion protection. Good viscosity-temperature behavior, good wear protection, demulsifying (water-repellent), air release, contain zinc. The RENOLIN B range meets and exceeds the minimum requirements of HLP hydraulic oils as per DIN 51 524-2.  ISO 6743/4, HM ISO 6743/6, CKC ISO 11158, HM Denison HF0, HF1, HF2	850	178	10	2.6	96	-42	As lubricating oils, particularly as hydraulic oils if good resistance to aging, wear protection and demulsifying properties are required. Universal hydraulic oils for all hydraulic systems, even if thermally stressed. Excellent filtration behavior.  (Refer to PI* 4-1207 for further details)
<b>RENOLIN B 5 VG 22</b>		863	200	22	4.4	107	-27	
<b>RENOLIN B 10 VG 32</b>		876	205	32	5.5	109	-24	
<b>RENOLIN B 15 VG 46</b>		875	210	46	6.9	105	-24	
<b>RENOLIN B 20 VG 68</b>		881	224	68	8.8	100	-24	
<b>RENOLIN B 30 VG 100</b>		883	232	100	11.1	96	-18	
<b>RENOLIN B 40 VG 150</b>		887	224	150	14.5	94	-15	

\* PI = Product information  
EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
AW = Anti-wear additives, to avoid wear in mixed friction areas

## RENOLIN B HVI – high-performance demulsifying AW/EP hydraulic oils with a high viscosity index, Denison HF0 approved



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN B 15 HVI</b>	Hydraulic and general lubricating oils (machine oils) with a high viscosity index and additives to improve aging behavior, corrosion protection and wear protection. The products of the RENOLIN B HVI range are HVLP hydraulic and circulating oils according to DIN 51 524-3, mineral oil-based, demulsifying (water-repellent) and contain zinc.  ISO 6743/4, HV ISO 11158, HV Denison HF0, HF1, HF2	859	180	15	3.8	151	-45	RENOLIN B HVI oils are suitable for all hydraulic systems, especially when a high viscosity index is specified or if excess viscosity during start-up or insufficient viscosity at operating temperature is a problem. High VI provides multigrade characteristics. <b>Energy saving through high efficiency.</b>  (Refer to PI* 4-1222 for further details)
<b>RENOLIN B 32 HVI</b>		871	178	32	6.3	152	-48	
<b>RENOLIN B 46 HVI</b>		879	186	46	8.1	149	-45	
<b>RENOLIN B 68 HVI</b>		868	240	68	11.0	153	-33	

HVLP oils (demulsifying)

## RENOLIN XtremeTemp – high-performance multigrade hydraulic oils based on new generation of base oils – shear stable, long lifetime



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN XtremeTemp 32</b>	Universal, high-performance hydraulic oils with high viscosity index and increased shear stability (VI ≥ 180). Based on special hydrogenated base oils, very good aging behavior, long lifetime, excellent corrosion protection and very good wear protection, fulfill and surpass DIN 51 524-3, HVLP, ISO 6743/4, HV ISO 11158, HV Denison HF0, HF1, HF2 RENOLIN XtremeTemp Plus with additional additives for prevention of stick-slip.	861	216	32	6.9	185	-33	Universal high-performance multigrade hydraulic oil for stationary and mobile hydraulic systems, improvement of efficiency, increasing change intervals. Multigrade characteristics through high, shear-stable viscosity index. <b>Energy and fuel saving through high efficiency.</b>  (Refer to PI* 4-1088 for further details)
<b>RENOLIN XtremeTemp 46</b>		853	234	48	9.3	180	-34	
<b>RENOLIN XtremeTemp 32 Plus</b>		861	216	32	6.9	183	-33	
<b>RENOLIN XtremeTemp 46 Plus</b>		855	234	48	9.3	181	-34	

HVLP oils (demulsifying)

\* PI = Product information  
EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
AW = Anti-wear additives, to avoid wear in mixed friction areas

## Specialties for the specialist – an overview.

## RENOLIN D – detergent AW/EP hydraulic and circulating oils



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN D 2</b>	Detergent hydraulic and general lubricating oils with additives to improve aging resistance, corrosion protection and wear protection. Favorable viscosity-temperature behavior. Contains zinc. The RENOLIN D range meets and exceeds the minimum requirements of HLPD hydraulic oils as per DIN 51 524-2.	844	155	7.2	2.2	99	-27	RENOLIN D oils are used as lubricating oils but especially as hydraulic oils when good aging resistance, good wear protection, detergency and dispersive properties are required. Universal hydraulic oils for all hydraulic systems, even if thermally stressed.
<b>RENOLIN D 3</b>		852	178	10	2.8	96	-30	
<b>RENOLIN D 5</b>		871	200	22	4.3	96	-27	
<b>RENOLIN D 10</b>		875	210	32	5.4	99	-24	
<b>RENOLIN D 15</b>		879	224	46	6.8	100	-27	
<b>RENOLIN D 20</b>		883	232	68	8.7	99	-24	
<b>RENOLIN D 30</b>	ISO 6743/4-HM with DD properties.	882	253	100	11.3	99	-21	(Refer to PI* 4-1010 for further details)

## RENOLIN MR – high detergent AW/EP circulating and hydraulic oils with excellent corrosion protection



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN MR 0 VG 2</b>	RENOLIN MR products are special HLPD lubricating and hydraulic fluids according to DIN 51 502 with outstanding corrosion protection and powerful cleaning and dirt holding capacity. Contain zinc as well as being detergent and dispersant. RENOLIN MR oils are used in many hydraulic systems as problem solvers, especially when standard oils cannot fulfill all requirements. RENOLIN MR oils fulfill and surpass the requirements of HLPD hydraulic oils according to DIN 51 524-2.	807	75	2.2	–	–	-42	RENOLIN MR 3: For machine tool spindles and roller bearing spindles in the textile industry. RENOLIN MR 5, 10 and 20: Heavy-duty hydraulic oils with outstanding corrosion protection up to continuous temperatures of 100°C. RENOLIN MR 5, 10 and 20: For smaller gearboxes, in particular with electrical multi-plate clutches. RENOLIN MR 30, 40, 90: For larger gearboxes. As running-in and anticorrosion oil. Allows oil changes to be extended.
<b>RENOLIN MR 1 VG 5</b>		837	85	5	1.7	83	-36	
<b>RENOLIN MR 3 VG 10</b>		852	166	10	2.6	91	-30	
<b>RENOLIN MR 5 VG 22</b>		868	165	22	4.3	100	-30	
<b>RENOLIN MR 10 VG 32</b>		875	208	32	5.6	114	-30	
<b>RENOLIN MR 15 VG 46</b>		877	220	46	6.9	105	-27	
<b>RENOLIN MR 20 VG 68</b>		881	225	68	8.9	105	-24	
<b>RENOLIN MR 30 VG 100</b>		883	248	100	11.4	100	-18	
<b>RENOLIN MR 40 VG 150</b>		889	250	150	14.8	98	-18	
	ISO 6743/4-HM with high DD performance.							(Refer to PI* 4-1249 for further details)

\* PI = Product information  
 EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
 AW = Anti-wear additives, to avoid wear in mixed friction areas



## RENOLIN MR 310/520/1030 – detergent AW/EP hydraulic and lubricating oils with extremely high viscosity index



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN MR 310</b>	Hydraulic and lubricating oils with extremely high viscosity index as well as outstanding cleaning properties and sludge carrying capacity.  HVLDP according to DIN 51 502 together with DIN 51 524. ISO 6743/4, HV	855	118	15	5.4	360	-48	RENOLIN MR 310, 520 and 1030: For all hydraulic systems which are subject to large temperature fluctuations or which are operated outdoors, e.g. in canal locks, weir machinery, machines or at particularly low application temperatures.  (Refer to PI* 4-1054 for further details)
<b>RENOLIN MR 520</b>		886	154	32	8.0	270	-60	
<b>RENOLIN MR 1030</b>		873	214	68	11.0	154	-36	

HVLDP oils (detergent/dispersant)

## RENOLIN MR MC – high-performance shear-stable AW/EP hydraulic and lubricating oils containing special base oils with high viscosity index



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN MR 22 MC</b>	Universal lubricating and hydraulic oils containing MC base oils with high viscosity index (shear-stable). Excellent oxidation stability and outstanding cleaning properties and sludge carrying capacity.  HVLDP according to DIN 51 524-3 MR 22 MC: HVLP (HV) 22 MR 32 MC: HVLP (HV) 32 MR 46 MC: HVLP (HV) 46 MR 68 MC: HVLP (HV) 68 ISO 6743/4, HV	856	200	22	4.9	153	-54	RENOLIN MR MC: Same application as for RENOLIN MR in addition to those which require detergent oils with very high shear stability.  Allow oil change intervals to be extended, grades to be rationalized. Multi-grade characteristics. Very wide operating temperature range. <b>Energy saving through high efficiency.</b>  (Refer to PI* 4-1249 for further details)
<b>RENOLIN MR 32 MC</b>		858	220	32	6.4	152	-48	
<b>RENOLIN MR 46 MC</b>		864	234	46	8.3	154	-48	
<b>RENOLIN MR 68 MC</b>		870	253	68	11.2	157	-42	

HVLDP oils (detergent/dispersant)

\* PI = Product information  
EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
AW = Anti-wear additives, to avoid wear in mixed friction areas

## Specialties for the specialist – an overview.

## RENOLIN LD – universal functional fluid with cleaning and flushing properties



Product name	Description	Density at 15 °C kg/m³	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm²/s	Kinematic viscosity at 100 °C mm²/s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN LD 10</b>	Specially refined oil with additives to increase aging resistance, corrosion protection and load-carrying capacity and reduce wear. Excellent cleaning properties and sludge carrying capacity.	877	220	46	6.9	105	-27	A functional fluid with cleaning and flushing properties for circulation lubrication and hydraulic systems. Eliminates gumming caused by infiltrating cooling lubricants. Machines can continue to run normally during cleaning and flushing. However, an oil change is recommended as soon as all contaminants are dislodged.

## RENOLIN ZAF MC – zinc-free and ash-free, shear stable, AW/EP high-performance hydraulic oils containing selected base oils, excellent oxidation stability



Product name	Description	Density at 15 °C kg/m³	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm²/s	Kinematic viscosity at 100 °C mm²/s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN ZAF 32 MC</b>	Lubricating and hydraulic oils containing MC base oils and selected additives. Very good oxidation and aging stability, very good corrosion protection and good wear protection. High viscosity index (shear-stable). Fulfill and surpass DIN 51 524-3; ISO 11158, HV ZAF 32 MC: HVL 32; ZAF 46 MC: HVL 46 ZAF 68 MC: HVL 68	840	246	35	6.7	149	-45	Shear-stable, zinc-free and ash-free hydraulic and circulating oils with a high viscosity index. For all mobile and stationary hydraulic systems. Allow oil change intervals to be extended and grades to be rationalized (multigrade characteristics). <b>Energy saving through high efficiency.</b>  (Refer to PI* 4-1055 for further details)
<b>RENOLIN ZAF 46 MC</b>		843	238	46	8.0	148	-45	
<b>RENOLIN ZAF 68 MC</b>		854	238	68	10.6	146	-42	

## RENOLIN ZAF B HT – demulsifying, AW/EP, zinc-free and ash-free hydraulic oils



Product name	Description	Density at 15 °C kg/m³	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm²/s	Kinematic viscosity at 100 °C mm²/s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN ZAF B 5 HT</b>	Zinc-free and ash-free lubricating and hydraulic oils with good aging resistance. They contain a newly developed additive system which reduces wear and inhibits corrosion.	824	130	4.6	1.6	105	<-54	Demulsifying, zinc-free and ash-free hydraulic and circulating oils with good aging resistance for all hydraulic drives even if thermally stressed. For reducing the environmental impact and costs associated with waste water processing.
<b>RENOLIN ZAF B 10 HT</b>		848	170	10	2.7	100	<-54	
<b>RENOLIN ZAF B 22 HT</b>		863	210	22	4.4	106	-33	
<b>RENOLIN ZAF B 32 HT</b>	HLP according to DIN 51 524-2 HM according to ISO 6743/4 HM according to ISO 11158	875	220	32	5.4	99	-33	(Refer to PI* 4-1366 for further details)
<b>RENOLIN ZAF B 46 HT</b>		876	230	46	6.8	101	-24	
<b>RENOLIN ZAF B 68 HT</b>		882	242	68	8.8	100	-21	
<b>RENOLIN ZAF B 100 HT</b>		882	240	100	11.3	99	-18	
<b>RENOLIN ZAF 150 BB</b>		888	225	150	14.6	94	-21	
<b>RENOLIN ZAF 220 BB</b>		894	240	220	18.6	94	-9	

\* PI = Product information  
 EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
 AW = Anti-wear additives, to avoid wear in mixed friction areas

## RENOLIN ZAF D – detergent, zinc-free and ash-free AW/EP hydraulic oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN ZAF 22 D</b>	Zinc-free and ash-free lubricating and hydraulic oils with detergent and dispersant additives. Good aging resistance. Reduce wear and inhibit corrosion.	866	204	23	4.4	98	-30	Detergent, zinc-free and ash-free hydraulic and circulating oils for all hydraulic drives even if thermally stressed. For reducing the environmental impact and costs associated with waste water processing.
<b>RENOLIN ZAF 32 D</b>		874	210	32	5.3	98	-27	
<b>RENOLIN ZAF 46 D</b>		876	230	46	7.1	106	-24	
<b>RENOLIN ZAF 68 D</b>	HLPD according to DIN 51 524-2	883	226	68	8.7	97	-19	

Zinc-free and ash-free HLPD oils (detergent)

## RENOLIN MWB – zinc-free and ash-free AW/EP hydraulic oils with excellent wear protection (high Brugger values) and good oxidation stability

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN MWB 46</b>	Selected solvent extracts with additives to improve oxidation and aging resistance. Excellent corrosion and wear protection, good load-carrying capacity and good friction behavior. High performance reserves. HLPD according to DIN 51 524-2 CLP according to DIN 51 517-3 CKC according to ISO 6743/6	882	218	46	6.9	105	-24	Heavy-duty hydraulic and circulating oils for all highly-stressed hydraulics. Excellent wear protection. High load-carrying capacity. High load capacity according to Brugger of >50 N/mm <sup>2</sup> , e.g. presses in the automotive industry.  (Refer to PI* 4-1059 for further details)
<b>RENOLIN MWB 68</b>		879	224	68	8.7	99	-18	

Zinc-free and ash-free HLPD oils (detergent)

## RENOLIN ZAF DT – highly detergent, zinc-free and ash-free AW/EP hydraulic oils with excellent wear protection

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>RENOLIN ZAF 5 DT</b>	Selected solvent extracts with special additives to improve protection against corrosion and wear. High load capacity according to Brugger. Detergent and dispersant formulations. Fulfill and surpass DIN 51 524-2, ISO 11158, HM CLP according to DIN 51 517-3 CKC according to ISO 6743/6	847	116	5	1.7	99	-40	Heavy-duty hydraulic and circulating oils with outstanding detergent and dispersant properties. Very good aging resistance, good corrosion protection and excellent load-carrying capacity. Complies with Daimler specification DBL 6721 for machine tools and presses.  (Refer to PI* 4-1125 for further details)
<b>RENOLIN ZAF 10 DT</b>		848	154	10	2.7	108	-30	
<b>RENOLIN ZAF 15 DT</b>		865	190	15	3.3	86	-27	
<b>RENOLIN ZAF 22 DT</b>		866	198	22	4.4	109	-27	
<b>RENOLIN ZAF 32 DT</b>		876	210	32	5.4	102	-24	
<b>RENOLIN ZAF 46 DT</b>		876	218	46	6.8	101	-24	
<b>RENOLIN ZAF 68 DT</b>		879	224	68	8.9	104	-18	
<b>RENOLIN ZAF 100 DT</b>	Exception: demulsifying properties	882	220	100	11.3	99	-18	
<b>RENOLIN ZAF 150 DT</b>		887	222	150	14.6	96	-15	

Zinc-free and ash-free HLPD oils (detergent)




\* PI = Product information  
EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
AW = Anti-wear additives, to avoid wear in mixed friction areas

## Specialties for the specialist – an overview.

## PLANTOSYN HVI – products in line with the latest requirements of the EU Ecolabel


NEW



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>PLANTOSYN 32 HVI</b> 	Rapidly biodegradable, universally deployable lubricating and hydraulic oils based on fully saturated synthetic esters for the toughest requirements with regard to temperature and aging resistance and material compatibility. Fulfill and surpass the requirements of ISO 15380 HEES and have been awarded the EU Ecolabel (low damage to water and soil, reduce CO <sub>2</sub> emissions).	915	220	32	6.2	148	-46	For all lubrication and hydraulic systems in environmentally sensitive areas in which a lubricant is required which ensures the highest level of technical performance and fulfills the requirements of the Ecolabel. Outperform many mineral oil-based hydraulic oils. ISO VG46, EU Ecolabel: PLANTOSYN 32 HVI: DE/027/104 PLANTOSYN 46 HVI: DE/027/105 PLANTOSYN 68 HVI: DE/027/106  (Refer to PI* 4-1273 for further details)
<b>PLANTOSYN 46 HVI</b> 		905	280	46	8.2	150	-36	
<b>PLANTOSYN 68 HVI</b> 		916	280	68	10.6	143	-27	

## PLANTOHYD N – vegetable oil-based, environmentally friendly hydraulic fluid



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Cleveland °C	Kinematic viscosity at 40 °C mm <sup>2</sup> /s	Kinematic viscosity at 100 °C mm <sup>2</sup> /s	Viscosity index VI	Pour-point °C	Main application area
<b>PLANTOHYD 40 N</b> 	Vegetable oil-based hydraulic oil with additives to increase oxidation and aging stability. Rapidly biodegradable, >90% in 14 days.  40 N-HETG 46 according to ISO 15380	922	306	44	9.6	211	-36	Universally deployable in hydraulic systems from -27°C to +70°C.  (Refer to PI* 4-1102 for further details)

\* PI = Product information  
 EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
 AW = Anti-wear additives, to avoid wear in mixed friction areas

## PLANTOHYD S – ester-based, environmentally friendly hydraulic fluids



Product name	Description	Density at 15°C kg/m³	Flash point Cleveland °C	Kinematic viscosity at 40°C mm²/s	Kinematic viscosity at 100°C mm²/s	Viscosity index VI	Pour-point °C	Main application area
<b>PLANTOHYD 15 S</b>	<p>Synthetic ester oils with additives to increase aging stability. Rapidly biodegradable, &gt;90% in 14 days. Oils from the PLANTOHYD and PLANTOSYN ranges offer excellent natural wear protection (FZG stage 12). 15 S: HEES 15 22 S: HEES 22 32 S: HEES 32 46 S: HEES 46 68 S: HEES 68 according to ISO 15380</p>	927	225	15	4.0	161	-51	<p>Universally deployable as lubricating and hydraulic oils, especially in areas with strict environmental protection requirements/goals. Operating temperature range -35°C to +90°C.</p> <p>Products from the PLANTOHYD and PLANTOSYN range outperform mineral oil-based hydraulic oils in a number of areas.</p>
<b>PLANTOHYD 22 S</b>		924	240	22	5.4	191	-36	
<b>PLANTOHYD 32 S</b>		921	246	32	7.1	188	-51	
<b>PLANTOHYD 46 S</b>		921	304	49	9.6	186	-42	
<b>PLANTOHYD 68 S</b>		927	280	69	12.2	177	-48	
<b>PLANTOHYD 22 S NWG</b>	Synthetic ester oils classified as non-hazardous to water in accordance with the current VwVwS (NWG).	905	195	23	5.5	191	-36	(Refer to PI* 4-1101 for further details)
<b>PLANTOHYD 46 S NWG</b>		920	290	47	9.6	192	-39	

HEES biodegradable oils

## PLANTOLUBE POLAR – ester-based, environmentally friendly, low-temperature hydraulic fluids



Product name	Description	Density at 15°C kg/m³	Flash point Cleveland °C	Kinematic viscosity at 40°C mm²/s	Kinematic viscosity at 100°C mm²/s	Viscosity index VI	Pour-point °C	Main application area
<b>PLANTOLUBE POLAR 15 S</b>	<p>PLANTOLUBE POLAR S oils are environmentally friendly, rapidly biodegradable and have an extremely low pour point. With their very high VI they cover a wide range of temperatures and can be used as all-season oils.</p> <p>PLANTOLUBE POLAR S oils offer outstanding protection against corrosion and wear. HEES 15 HEES 22 according to ISO 15380, changeover guidelines ISO 15380 should be observed</p>	899	156	15	4.1	199	<-48	<p>PLANTOLUBE POLAR S oils are recommended for gearboxes, bearings and actuators which are subject to extremely low temperatures (e.g. in polar regions, refrigerated warehouses, etc.) and for hydraulic systems operated in similar conditions.</p> <p>(Refer to PI* 4-1098 for further details)</p>
<b>PLANTOLUBE POLAR 22 S</b>		908	166	22	5.7	200	<-51	

HEES biodegradable oils

\* PI = Product information  
EP = Extreme pressure additives, to avoid wear and scuffing at high pressures and loads  
AW = Anti-wear additives, to avoid wear in mixed friction areas



# Further specialties.

**RENOLIN UNISYN OL-series** – Fully synthetic compressor and hydraulic oils based on PAO (polyalphaolefin) with excellent hydraulic performance. Multigrade characteristics, high natural VI (shear-stable), outstanding low-temperature properties, good aging stability, good wear protection.

**RENOLIN LIFT-series** – Friction-reducing fluids. Mineral-based hydraulic oils containing special additives to avoid stick-slip. Low coefficients of friction, good detergency, good dirt holding capacity.

**RENOLIN DO 22 HV** – Special hydraulic oil based on selected base oils with extremely high viscosity index (VI = 359). RENOLIN DO 22 HV reduced friction, has excellent low-temperature behavior and high aging stability.

**RENOLIN HLP 46 ALU** – Special, synthetic hydraulic oil with excellent aluminum compatibility. Non-staining oil, good wear protection, good aging stability.

**RENOLIN MRX-series** – Cleaning and anticorrosion oils. Special hydraulic oils with improved cleaning and anticorrosive properties.

**HYDROTHERM 46 M** – Fire-resistant, water-glycol, type HFC hydraulic oil. Conforms to the requirements of the 7th Luxembourg Report. Excellent corrosion and wear protection. BOSCH REXROTH approved for high-pressure applications (flushing and preserving oil – Hydrotherm PK).

**HYDROTHERM 68 LW RED** – Fire-resistant hydraulic oil, type HFCE – water/glycol – conforms to the requirements of the 7th Luxembourg Report. Approved by DSK – Deutsche Steinkohle AG, higher temperature stability than HFC oils, good AW/EP wear protection (FZG failure load stage > 12), water content approx. 20% = HFCE.

**RENOSAFE DU 46** – Fire-resistant, water-free hydraulic oil. Type HFDU, polyol ester, suitable for use in VOITH converters.

**PLANTOFLUX AT-S-series** – Fire-resistant, water-free hydraulic oils. Type HFDU, polyol ester, rapidly biodegradable, Factory Mutual Approved (USA). Conforms to the requirements of the 7th Luxembourg Report.

**RENOSAFE FIRE PROTECT** – Fire-resistant, water-free hydraulic oil. Type HFDU, rapidly biodegradable. Conforms to the requirements of the 7th Luxembourg Report. Fulfills and surpasses all requirements acc. to ISO 12922.

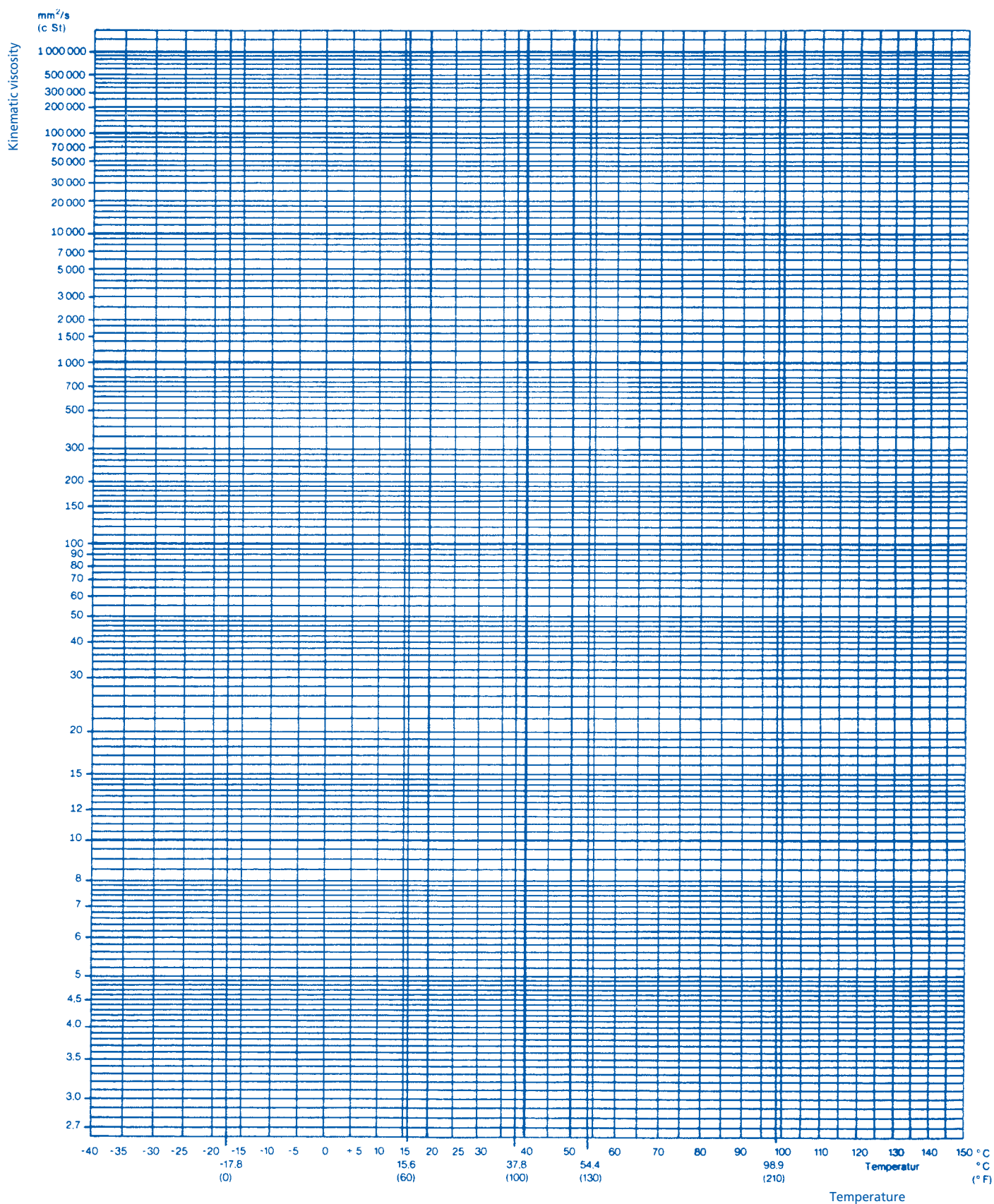
**RENOSAFE TURBO 46 DR** – Fire-resistant, water-free hydraulic oil. Type HFDR, phosphoric acid ester, hydrolytically stable. Control circuit fluid for steam and gas turbines.

**FUCHS lubricants and hydraulic oils for the foodstuff and pharmaceutical industries (NSF-H1 approved).**

A comprehensive range of hydraulic oils and lubricating oils based on synthetic components (PAO).

Just call us!

## Viscosity-temperature diagram.



## **Innovative lubricants need experienced application engineers**

Every lubricant change should be preceded by expert consultation on the application in question. Only then the best lubricant system can 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 19  
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 19  
68169 Mannheim / Germany  
Phone: +49 621 3701-1703  
Fax: +49 621 3701-7719