



Product Program  
**Industrial  
Lubricants**

1/2018

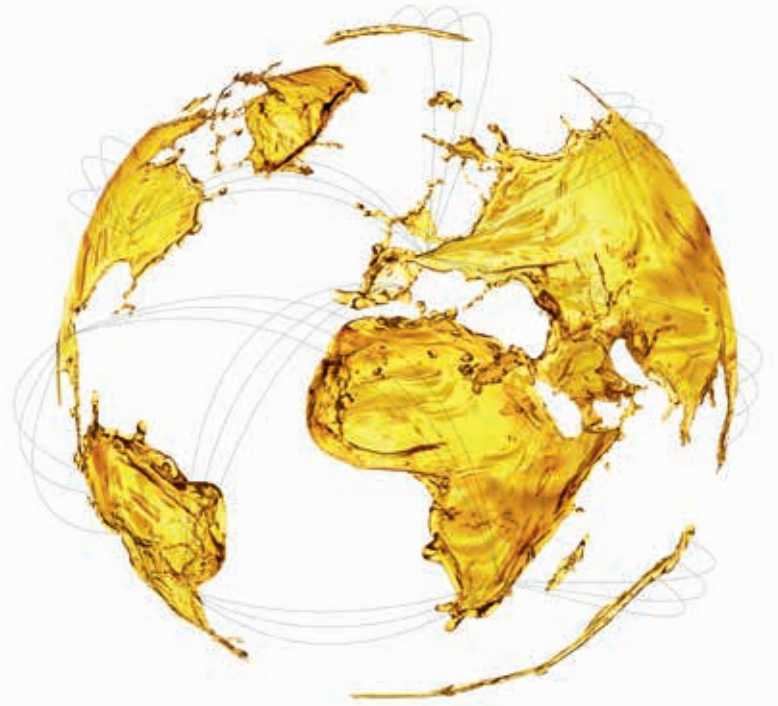


# LUBRICANTS. TECHNOLOGY. PEOPLE.

We focus consistently on high-quality lubricants and related specialties.

We develop innovative and holistic solutions for a wide variety of applications.

We value the high level of commitment of our employees and their trusting interaction with one another.



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## Facts and figures

**Company:** FUCHS SCHMIERSTOFFE GMBH, a company of the FUCHS Group

**Headquarters:** Mannheim

**Product range:** A full range of more than 2,000 products and 6,000 articles

**Certifications:** ISO/TS 16949, ISO 14001, BS OHSAS 18001, ISO 50001

**References:** One of the leading lubricants OEM for the German automotive industry

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FUCHS has developed, produced and sold lubricants and related specialties for more than 80 years – for virtually all areas of application and sectors. With over 100,000 customers and 57 companies worldwide, the FUCHS Group is the leading independent supplier of lubricants.

A team of more than 800 specialists across Germany works to guarantee the satisfaction of our customers. Whatever their requirements, we have the ideal lubricant for their specific applications and processes. In our technology centre we link interdisciplinary expertise in a quick and efficient way – and work on innovative lubricant solutions to meet the demands of today and tomorrow every single day.



## The World of Industrial Lubricants



### Industrial Oils

Industrial lubricants have an important task in the generation and transmission of energy, in the reduction or transmission of drive forces, in the deployment of machine tools, when generating cooling air or compressed air and for many other applications in production. FUCHS industrial lubricants can make a significant contribution to achieving higher productivity, improving efficiency and saving energy, for example in hydraulic systems, gear units and many other applications. Furthermore, rapidly biodegradable lubricants from FUCHS present a real alternative to hydrocarbon-based lubricants.

**RENOLIN, RENISO,  
RENEP, PLANTO**

### Greases

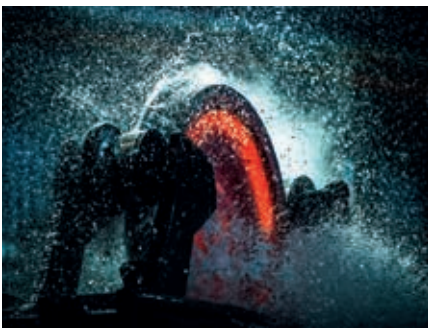
Lubricating greases are consistent lubricants made up of base oil and a specially chosen thickener. To increase certain properties, additives are added to the lubricating greases. Lubricating greases are structural elements, especially when used as long-life lubricants for lifetime lubrication. **RENOLIT** industrial lubricating greases are a balanced and complete package offering the ideal technical and economical solution in the largest possible number of lubricating grease applications in industry.

**RENOLIT, PLANTO**

### Cutting Fluids

Today, a modern cutting fluid is subjected to a variety of demands. Cooling lubricants for metalworking processes must be effective, economical and free from ingredients that are harmful to health and the environment. In process chains downstream of metalworking, customized cleaning agent solutions and process-compatible and reliable corrosion preventatives play a decisive role when it comes to production reliability and product quality. That's why optimally matched lubricant concepts are important – because all process steps must be taken into account. With its comprehensive range of lubricants and its many years of application experience, FUCHS understands the processes of its customers like no other lubricant manufacturer.

**ECOCOOL, ECOCUT**



### Quenching Products

Fluids are highly important in the area of heat treatment in particular: the required microstructure compositions and degrees of solidity can only be achieved with the right quenching medium. An altered quenching characteristic has a direct effect on the hardened microstructure, on the properties of the material and thereby also on its later deployment. Place your trust in a partner that understands the full heat treatment process, that uses that knowledge to advise you and provides you with system solutions – to your benefit.

**THERMISOL**



### Cleaner

When manufacturing metal products, all materials that have a negative impact on the subsequent production steps or disrupt the later use of the metallic object must be removed from the surfaces. In addition to an extensive consulting, FUCHS offers everything from a single source. Perfectly matched products together with a comprehensive spectrum of industrial cleaners ensure a high level of process safety by avoiding product incompatibility as well as delivering excellent performance in virtually all cleaning processes.

**RENOCLEAN**



### Corrosion Protection Forming Lubricants

Corrosion protection measures must be optimally compatible with upstream process steps and the products used there. Our recommendation: the compatible **ANTICORIT** corrosion protection products. A wide range of film types is available, from oily to vaseline-type or waxy films. If no film is desired, we solve your corrosion protection problems with our complete VCI range comprising papers, foils, tablets, foams and many other special solutions.

**RENOFORM  
ANTICORIT**

## FUCHS lubricants

stand for performance and sustainability, for safety and reliability, for efficiency and cost savings.

They represent a promise: **technology that pays back.**



Fuel saving



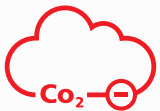
Process compatibility



Rapidly biodegradable



Corrosion protection



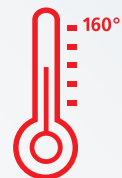
Reduced CO<sub>2</sub>



Extension of maintenance intervals



Food grade



High thermal resistance



Less wear



Reduced oil consumption

## Examples for Key Technologies

### RENOLIN XTREMETEMP 46 INDUSTRIAL OIL

A special product in terms of sustainability is the hydraulic oil RENOLIN XtremeTemp 46. Thanks to its special composition, it displays fuel saving potential of 3% to 6% in mobile hydraulics applications.

### RENOLIN ZAF B HT INDUSTRIAL OIL

The RENOLIN ZAF B HT range excels through high thermal and oxidative resistance and excellent wear-protection characteristics. In combination with selected mineral oil-based solvent raffinates, the innovative zinc-free and ash-free additive technology guarantees excellent hydraulic and gear oil properties.

### RENOLIN GEAR VCI INDUSTRIAL OIL

The new RENOLIN GEAR VCI product is a high performance industrial gear oil that combines the properties of a high performance gear oil with reliable corrosion protection. Thanks to its vapor phase corrosion protection, the product guarantees reliable long-term protection and is used in transmissions that have long downtimes or are stored for an extended period of time.

### ECOCOOL PHH AL COOLING LUBRICANT

With ECOCOOL PHH AL, FUCHS has developed a universally deployable cooling lubricant for aerospace applications that is suitable for all kinds of material groups, is boron and biocide-free and fulfills the requirements of REACH and TSCA. Beside the standard market engine materials (titanium, nickel and aluminium alloys), the test also had to be passed for older high-strength steels to be approved for use at Lufthansa Technik.

### ANTICORIT CPX®

#### LONG-TERM CORROSION PREVENTION

With its ANTICORIT CPX® range, FUCHS has developed a new formulation category for long-term corrosion protection (10 years). This new wax system guarantees controlled runoff inhibition, both at increased temperatures and at normal ambient temperatures, without compromising penetration into gaps and flanges. It also easy to remove. Individual parameters – such as drying time, run-off tendency, period of corrosion protection and film flexibility – can be customized according to customer requirements. CPX® technology is extremely versatile and suitable for a whole host of different applications, whether cavity protection, long-term warehousing or transport protection.

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# INDUSTRIAL OILS

Many processes in the industry work perfectly only with specially tailored lubricant solutions.

For example, in the transmission of energy by pressure media (hydraulic fluids), in the gearing of driving forces (gear oils), in the power generation in power plants (turbine oils), at refrigeration (refrigeration oils) or compressed air production (air compressor oils) the respective industrial oils have a significant task.

In addition, FUCHS industrial lubricants can make a significant contribution to a improved productivity in many other applications. They can increase efficiency significantly and reduce energy consumption and associated CO<sub>2</sub> emissions.

Low Varnish turbine oils e.g. ensure trouble-free operation of power plants. Refrigeration oils adjusted to environmentally neutral refrigerants improve the environmental balance in the cold chain. Rapidly biodegradable lubricants are a powerful alternative to hydrocarbon-based lubricants.





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**Industrial Oils**

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## Industrial Oils



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Machine Oils: AR</b>								
<b>RENOLIN AR 14</b>	<b>Range RENOLIN AR</b> General lubricating oils based on mineral oil. Exceeds the requirements of L-AN lubricating oils according to DIN 51 501.	884	250	64	8.2	96	-10	For lubrication systems without special requirements regarding aging resistance, cold temperature behaviour, etc. Oil temperature should not exceed 70 °C. Lowest inlet temperature of the oil should be 5 °C above the pourpoint.
<b>RENOLIN AR 19</b>		883	260	100	11.0	94	-15	
<b>RENOLIN AR 22</b>		AR 14: AN 68 AR 19: AN 100 AR 22: AN 150	888	240	150	14.6	96	

# RENOLIN

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
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## Demulsifying Circulating, Spindle and Hydraulic Oils: HL / CL

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>RENOLIN DTA 2</b>	<b>Range RENOLIN DTA</b> Hydraulic and lubrication oils based on selected base oils with additives to improve ageing stability and corrosion protection.	805	100	2.2	–	–	-27	For thermally-stressed bearings, gears and hydraulic systems with peak temperatures up to 120 °C. Lubrication oils without AW/EP additives.
<b>RENOLIN DTA 5</b>		837	120	4.6	1.6	106	-40	
<b>RENOLIN DTA 7</b>	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-separation), zinc free.  ISO 6743/4, HL, ISO 6743-6 and ISO 12925-1:CKB.	839	155	7.4	2.2	103	-27	Also suitable for hydrodynamic drives if HL or CL lubrication fluids are required.
<b>RENOLIN DTA 10</b>		851	174	10	2.6	92	-27	VOITH Turbo couplings type T and S.
<b>RENOLIN DTA 15</b>		856	195	15	3.4	98	-27	Suitable for Landis Lund machine tool spindles (without AW/EP).
<b>RENOLIN DTA 22</b>		865	210	22	4.2	94	-27	Demulsifying type
<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	

## Zinc Containing Hydraulic Oils: HLP

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>RENOLIN B 3</b>	<b>Range RENOLIN B</b> Lubrication and hydraulic oils with additives to improve the ageing and oxidation stability. Good wear protection, demulsifying (good water separation), good air release properties, zinc containing AW/EP additive system.  The RENOLIN B range meets and surpasses the minimum requirements of HLP hydraulic oils acc. to DIN 51 524-2. ISO 6743 / 4, HM ISO 6743 / 6, CKC  ISO 11158, HM B 3: HLP 10 B 5: HLP 22 B 10: HLP 32 B 15: HLP 46 B 20: HLP 68 B 30: HLP 100	850	178	10	2.6	95	-42	Universal applicable hydraulic fluids if good ageing resistance, good wear protection and demulsifying properties are required.
<b>RENOLIN B 5</b>		863	200	22	4.4	107	-27	
<b>RENOLIN B 10</b>		876	205	32	5.5	109	-24	Universal hydraulic fluids; synergistic acting and robust additives ensure good wear protection in stationary and mobile hydraulic systems, even at high load and high temperature.
<b>RENOLIN B 15</b>		875	210	46	6.9	105	-24	
<b>RENOLIN B 20</b>		881	224	68	8.8	100	-24	DENISON HF-0 approval Bosch Rexroth
<b>RENOLIN B 30</b>		883	232	100	11.1	96	-18	Demulsifying type



## Industrial Oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Zinc Containing Hydraulic Oils</b>								
<b>RENOLIN B 32 HP</b>	<b>Range RENOLIN B HP</b> Hydraulic oils with additives to improve ageing and oxidation stability, excellent AW/EP wear protection even at high loads and temperature; demulsifying. Surpass HLP requirements. HLP hydraulic oils according to DIN 51 524-2 and ISO 6743/4:HM.	880	205	32	5.48	107	-24	Suitable for all hydraulics especially if an approval according to BOSCH Rexroth RDE 90245 is required. Mineral oils for HP - high pressure application. Demulsifying type  Approvals: Bosch Rexroth RD 90235, RDE 90245
<b>RENOLIN B 46 HP</b>		880	210	46	6.93	106	-24	
<b>RENOLIN B 68 HP</b>		880	225	68	8.8	102	-24	
<b>RENOLIN B HP 32 PLUS</b>	<b>Range RENOLIN B HP PLUS</b> Hydraulic oils, based on high-quality, hydrated base oils group II. Contains additives for excellent ageing and oxidation stability, the zinc-containing AW/EP additive system protects against wear at high pressure and load. Extended oil drain intervals are possible.  Hydraulic oils according to DIN 51524-2 HLP and ISO 6743-4 - HM.	860	216	32	5.5	110	-39	Suitable for all hydraulics especially if an approval according to BOSCH Rexroth RDE 90235/ RDE 90245 is required. Group II base oil (Hydrogenated base oil), for HP-high pressure application. Demulsifying type  Approvals: Bosch Rexroth RD 90235, RDE 90245
<b>RENOLIN B HP 46 PLUS</b>		870	236	46	6.94	110	-36	
<b>RENOLIN B HP 68 PLUS</b>		870	236	68	9.05	109	-33	
<b>RENOLIN B 15 HVI</b>	<b>Range RENOLIN B HVI</b> Hydraulic and lubricating oils (machine oils) with a high viscosity index and additives to improve aging stability, 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 and zinc-containing AW/EP additives. DIN 51 524-3 - HVLP 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 required, reduced viscosity during cold start-up, high viscosity at operating temperature. High VI provides multigrade characteristics. Energy saving through high volumetric efficiency. Demulsifying type  Approval: Denison HF0, HF1, HF2
<b>RENOLIN B 22 HVI</b>		866	178	22	4.9	151	-45	
<b>RENOLIN B 32 HVI</b>		871	178	32	6.3	152	-48	
<b>RENOLIN B 46 HVI</b>		879	186	46	8.1	150	-45	
<b>RENOLIN B 68 HVI</b>		868	240	68	11.0	153	-36	
<b>RENOLIN D 2</b>	<b>Range RENOLIN D</b> Detergent lubrication and hydraulic oils with additives to improve ageing resistance, corrosion protection and wear protection. Good viscosity temperature behavior. Zinc-containing AW/EP additives system. The RENOLIN D range meets and surpasses the minimum requirements of HLPD hydraulic oils. HLPD according to DIN 51 524-2. ISO 6743 / 4-HM with DD-properties.	844	155	7,2	2.2	99	-27	RENOLIN D oils are used as lubricating and hydraulic oils when good ageing resistance, good wear protection, detergent and dispersant properties are required. Universal hydraulic oils for all hydraulic systems, even if thermally stressed.  DD-properties
<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	5.3	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 46 HVI</b>		As RENOLIN D with additional additives for improved viscosity-temperature behavior. HVLPD 46. DIN 51 524-3 - HVLP-D ISO 6743-4 HV	876	186	46	8.2	151	

# RENOLIN

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Zinc Containing Hydraulic Oils</b>								
<b>RENOLIN XtremeTemp 32</b>	<b>Range RENOLIN XtremeTemp</b> Universal, high-performance hydraulic oils with high viscosity index and excellent shear stability (VI 180). Based on special hydrogenated base oils, very good ageing behavior, long lifetime, excellent corrosion protection and very good wear protection, fulfills and surpasses DIN 51 524-3, HVLP ISO 6743 / 4, HV ISO 11158, HV zinc containing AW/EP additive system  Denison HF0, HF1, HF2. RENOLIN XtremeTemp Plus with additional Anti Stick-Slip additives	845	216	32	6.9	180	-33	Universal high-performance multigrade hydraulic oil for stationary and mobile hydraulic systems, improved efficiency, increasing oil change intervals. Multigrade characteristics through high, shear-stable viscosity index. Energy and fuel saving through high volumetric efficiency.  Approvals: Denison HF0, HF1, HF2 Bosch Rexroth RD90235 and RDE90245
<b>RENOLIN XtremeTemp 46</b>		853	230	48	9.3	180	-34	
<b>RENOLIN XtremeTemp 32 Plus</b>	<b>Range RENOLIN XtremeTemp Plus</b> As RENOLIN XtremeTemp, but with additives which helps to avoid stick-slip phenomena. For high-pressure applications; reduce friction especially in mixed friction conditions  DIN 51 524-3 - HVLP(D) ISO 6743-4 - HV According Denison and Bosch Rexroth requirements	861	216	32	6.9	183	-33	Slightly detergent, HVLP (D) high performance multigrade hydraulic oil for stationary and mobile hydraulic systems surpass HVLPD acc. to DIN 51 524-3, wide temperature window, excellent shear stability. Helps to avoid stick-slip problems, especially at low speed and high load. Energy and fuel saving through high volumetric efficiency.
<b>RENOLIN XtremeTemp 46 Plus</b>		855	234	48	9.3	181	-34	
<b>RENOLIN LIFT 22</b>	<b>Range RENOLIN LIFT</b> Special detergent type of hydraulic oils for elevators and hydraulic conveyors, fork lifters. Reliably prevents stick-slip, especially at high loads and low speeds.  HLPD hydraulic oils according to DIN 51 524-2, ISO 11158-HM. ISO 6743/4:HM	869	210	22	4.3	100	-30	Fork lifters, elevators, hydraulic transport mechanisms, stationary and mobile hydraulics. Protection against stick-slip.
<b>RENOLIN LIFT 32</b>		877	210	32	5.3	96	-30	
<b>RENOLIN LIFT 46</b>		881	210	46	6.8	101	-27	

## Industrial Oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Zinc Containing Hydraulic Oils</b>								
<b>RENOLIN MR 0 VG 2</b>	<b>Range RENOLIN MR</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 carrying capacity. Zinc containing, 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. ISO 6743 / 4-HM with high DD-performance.	807	75	2,2	–	–	-42	<u>RENOLIN MR 3:</u> For machine tool spindles and roller bearing spindles in the textile industry.
<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	<u>RENOLIN MR 5, 10, 15 and 20:</u> Universal hydraulic oils with outstanding corrosion protection up to continuous temperatures of 100 °C. For smaller gearboxes, in particular with electrical multi-plate clutches.
<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	High DD performance
<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	<u>RENOLIN MR 30, 40:</u> For larger gearboxes. As running-in and anticorrosion oil. Allows oil changes to be extended.
<b>RENOLIN MR 40 VG 150</b>		889	250	150	14.8	98	-18	
<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 51 524-3. ISO 6743/4, HV	855	118	15	5.4	360	-48
<b>RENOLIN MR 520</b>	886		154	32	8.0	270	-60	
<b>RENOLIN MR 1030</b>	873		214	68	11.0	154	-36	
<b>RENOLIN MR 22 MC</b>	<b>Range RENOLIN MR-MC</b> Universal lubricating and hydraulic oils based on 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: HVLDP 22 MR 32 MC: HVLDP 32 MR 46 MC: HVLDP 46 MR 68 MC: HVLDP 68		856	200	22	4.9	153	-54
<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	
<b>RENOLIN MRX 32</b>		<b>Range RENOLIN MRX</b> Selected, and high quality special refined oil with additives to maximize aging protection, reduce wear and friction. High detergent and sludge carrying capacity; excellent protection against corrosion: DIN 51 524-HLPD MRX 32: HLPD 32 MRX 46: HLPD 46	878	228	32	5.5	108	-27
<b>RENOLIN MRX 46</b>	884		232	46	6.9	103	-24	



# RENOLIN

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Zinc- and Ash-free Hydraulic Oils (ZAF)</b>								
<b>RENOLIN MWB 46</b>	<b>Range RENOLIN MWB</b> Selected solvent base oils with additives to improve oxidation and ageing resistance. Excellent corrosion and wear protection, good load-carrying capacity and low friction. High performance reserves. Zinc-free AW/EP additive system  HLPD according to DIN 51 524-2 MWB 46:HLPD 46 MWB 68:HLPD 68	882	218	46	6.9	105	-24	Heavy-duty HLPD hydraulic and circulating oils (CLP) for all highly stressed hydraulics. Excellent wear protection. High load-carrying capacity. High load capacity according to Bruggen of ≥50 N/mm <sup>2</sup> , e.g. hydraulic presses in the automotive industry.
<b>RENOLIN MWB 68</b>		879	224	68	8.7	99	-18	
<b>RENOLIN ZAF B 5 HT</b>	<b>Range RENOLIN ZAF B HT</b> Zinc-and ash-free, demulsifying hydraulic and gear oils with good ageing stability and oxidation resistance. Excellent wear protection for gears (FLS > 12) and roller bearings. High corrosion protection, even in the presence of water, excellent non-ferrous metal compatibility.  HLP according to DIN 51 524-2 HM acc. to ISO 6743-4 HM acc. to ISO 11158 HM acc. to 6743-6 CLP acc. to DIN 51 517-3 CKC acc. to ISO 6743-4 (DBL 6713-13, HLP, Daimler)	824	130	4,6	1.6	105	<-54	Demulsifying, zinc- and ash-free HLP hydraulic and CLP lubricating oils with good ageing resistance for all hydraulic systems, hydraulic presses or machine tools. Bruggen ≥ 30N/mm <sup>2</sup>  Demulsifying type
<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>		875	220	32	5.4	96	-33	
<b>RENOLIN ZAF B 46 HT</b>		876	230	46	6.8	101	-27	
<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>	Zinc- and ash-free, demulsifying lubrication and hydraulic oils with high ageing resistance. Contains additives to improve corrosion and anti-wear properties. Fulfills and surpasses requirements according to DIN 51 524-2 - HLP HM acc. to ISO 6743-4	893	225	150	14.6	94	-21	
<b>RENOLIN ZAF 220 BB</b>		894	240	220	13.6	94	-9	
<b>RENOLIN ZAF D 22 HT</b>	<b>Range RENOLIN ZAF D HT</b> Zinc and ash-free lubricating and hydraulic oils with detergent and dispersant properties. Good ageing resistance, excellent wear protection and oxidation stability, good air release properties. Fulfills and surpasses requirements acc. to DIN 51 524-2 HLP-D. ISO 6743-4: HM DIN 51 517-3:CLPD ISO 6745-6:CKC	860	206	22	4.3	103	-33	Detergent, zinc- and ash-free hydraulic HLPD and lubrication oils CLP for all hydraulic drives even if thermally stressed. Also suitable for use as CLP lubricating oil. Bruggen ≥ 30N/mm <sup>2</sup>
<b>RENOLIN ZAF D 32 HT</b>		870	220	32	5.3	97	-33	
<b>RENOLIN ZAF D 46 HT</b>		880	230	46	6.8	100	-27	
<b>RENOLIN ZAF D 68 HT</b>		880	>230	68	8.8	100	-27	

## Industrial Oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Zinc- and Ash-free Hydraulic Oils (ZAF)</b>								
<b>RENOLIN ZAF D 46 HT PLUS</b>	Universal zinc- and ash-free hydraulic fluid and lubricating oil, excellent ageing stability and high wear protection. Provides high deterging and dispersing properties. Passes and surpasses the requirements according to DIN 51 524-2: HLPD, ISO 6743-4: HM, DIN 51 517-3: CLP, ISO 6743-6: CKC.	866	230	46	6.9	106	-39	Detergent zinc- and ash-free hydraulic oils <b>based on hydro-treated group II base oils</b> with improved oxidation stability at high thermal stresses, for hydraulic presses.  Brugger ≥ 30 N/mm <sup>2</sup>  Extended lifetime, excellent air release, detergent/dispersant type
<b>RENOLIN ZAF 46 D-White</b>	Universal zinc- and ash-free detergent type of hydraulic fluid and industrial gear oil, excellent ageing stability, very high wear protection, latest base oil generation, hydrotreated base oils and low sulphur content. Passes and surpasses the requirements according to DIN 51 524-2: HLP, HLPD ISO 6743-4: HM	865	>230	46	6.9	106	-39	Excellent for all applications in mobile and stationary hydraulic systems, recommended according to DIN 51 524-2 (HLP).  Based on hydrotreated group II base oils, <b>"non-discoloration oil"</b> .  Detergent type
<b>RENOLIN ZAF 5 DT</b>	<b>Range RENOLIN ZAF DT</b> Selected solvent extracts with special additives to improve corrosion protection and wear protection. High load-carrying capacity acc. to Brugger. Detergent and dispersant. Fulfill and surpass DIN 51 524-2 HLPD (except detergent / dispersant). ISO 11158: HM CLP acc. to DIN 51 517-3 (detergent / dispersant) CKC acc. 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 ageing resistance, good corrosion protection and excellent load-carrying capacity. Daimler DBL 6721 for machine tools Brugger value ≥ 50 N/mm <sup>2</sup>  Detergent type
<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>		882	220	100	11.3	99	-18	
<b>RENOLIN ZAF 150 DT</b>		887	222	150	14.6	96	-15	
<b>RENOLIN ZAF 32 MC</b>		<b>Range RENOLIN ZAF MC</b> Lubricating and hydraulic oils based on group III base oils and selected additives. Very good oxidation and ageing stability, very good corrosion protection and high wear protection. High viscosity index (shear stable). Fulfill and surpass DIN 51 524-2: HLP DIN 51 524-3: HVLP ISO 6743-4: HM ISO 6743-4: HV DIN 51 517-3:CLP ISO 6743-6 CKC DBL 6713: HLP, HVLP	840	246	35	6.7	149	
<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

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Hydraulic Oils</b>								
<b>RENOLIN ZAF 520</b>	Zinc- and ash-free special hydraulic and lubricating oil with extreme high viscosity index. Thus very good viscosity-temperature behaviour. Fulfills and surpasses DIN 51 524-3 HVLP.	868	160	34	9.2	267	-30	For all hydraulic systems with high temperature variations also for low-temperature applications.
<b>RENOLIN ZAF 15 LT</b>	<b>Range RENOLIN ZAF LT</b> Zinc- and ash-free hydraulic oils with very high viscosity index for low-temperature applications. Demulsifying with additives to improve ageing stability and corrosion protection. Surpass the requirements on DIN 51 524-3: HVLP.	873	>90	14	5.3	387	<-60	Developed for the use in applications with very low ambient temperatures in mobile and stationary equipment; latest additive technology. (ZAF)
<b>RENOLIN ZAF 32 LT</b>		869	155	31	8.7	281	<-60	Demulsifying type
<b>RENOLIN HighPress 46 DLC</b>	<b>Range RENOLIN HighPress DLC</b> Zinc- and ash-free high performance EP hydraulic oil for Ortlinghaus lamellar clutch systems (hydraulic presses). Excellent detergent and dispersant properties, very good wear protection (FZG failure load stage 12 / Bruggen value 50 N/mm <sup>2</sup> ). Fulfills and surpasses the requirements on hydraulic oils HLPD acc. to DIN 51 524-2 and ISO 11158: HM.	877	212	46	6.8	100	–	Especially suitable for the use in systems with Ortlinghaus lamellar clutches. Defined friction coefficients are proved in use (static and dynamic).  Müller Weingarten DT 55005 Ortlinghaus lamellar clutches ON 9.2.19  Also suitable for the use in circulation and bearing lubrication in all hydraulic presses.
<b>RENOLIN PG 32</b>	<b>Range RENOLIN PG</b> Fully-synthetic hydraulic and lubricating oils based on polyglycols for highest requirements regarding thermal stability, high viscosity index. Not miscible or compatible with mineral oils, water-soluble. Classification acc. to VDMA 24 569 PG 32: HEPG 32 PG 46: HEPG 46 Exceed ISO 15380 HEPG. Fulfil and surpass the requirements on hydraulic oils HVLP acc. to DIN 51 524-3.	1022	220	32	7.1	194	-54	For highly loaded hydraulic and lubricating systems with extreme thermal load. Please consider change-over guidelines. Water-soluble PAG hydraulic oil, not miscible or compatible with mineral oils or PAO oils.
<b>RENOLIN PG 46</b>		1029	240	46	9.7	203	-48	

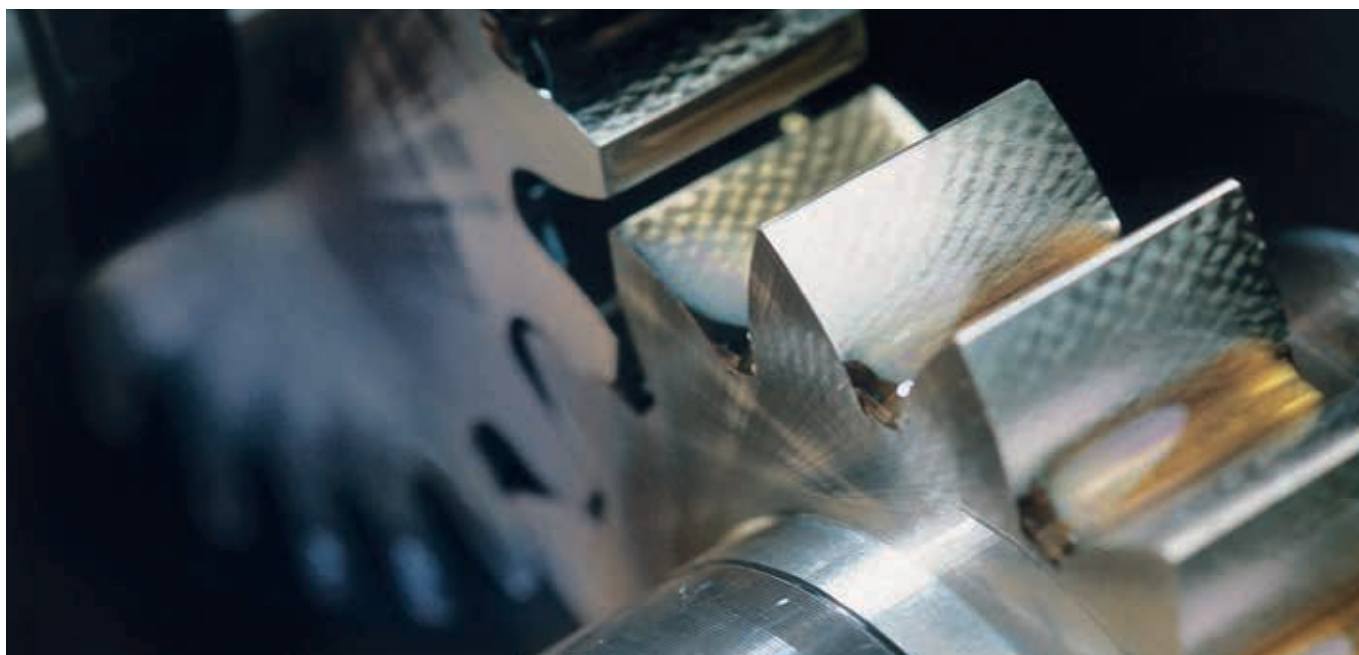


## Industrial Oils

## HYDROTHERM, RENOSAFE

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Fire-resistant Hydraulic Fluids</b>								
<b>HYDROTHERM 46 M</b>	Based on water-glycol; tested and approved acc. to 6th and 7th Luxembourg report. Good wear protection, very good corrosion protection, extreme ageing resistance. HFC hydraulic oil acc. to DIN 51 502 and VDMA 24 317, ISO 12922: HFC 46.	1048	–	46	9.5	195	-42	For all hydraulic systems in fire hazard areas (mining, steel industry, aluminium industry, foundry, forging, glass industry). Suitable for all materials, paintings and elastomers which are resistant to water-glycol. Monoethylene-free and amine-free.
<b>RENOSAFE DU 46</b>	Water-free fire-resistant fluid based on special esters. Voith-Turbo Approval HFDU acc. to ISO 12922	922	>250	48	9.7	188	-45	Fire-resistant hydraulic fluid based on special organic esters - HFDU. Optimized for turbo couplings. Compatible with mineral oils. Compatibility with sealings, tubes and paintings has to be checked.
<b>RENOSAFE TURBO 46 HF</b> <b>NEW</b>	Water-free, fire-resistant, special, thermally stable phosphoric acid esters. Good demulsibility (water separation), low foaming tendency, high oxidation stability. ISO 12922: HFDR46	1150	>250	44	5.0	-35	-24	Hydraulic fluid in fire hazard areas. For electro hydraulic control circulations in steam turbines, bearing lubrication for steam- and gas turbines, phosphoric ester. New HFDR technology.
<b>RENOSAFE FireProtect 46</b>	<b>Range RENOSAFE FireProtect</b> Water-free, fire-resistant hydraulic fluids based on latest ester and additive technology, type HFDU.	920	270	50	10.4	203	-42	For the use as fire-resistant hydraulic oils based on organic esters. Type HFDU for all hydraulic applications in fire hazard areas or glowing metal surfaces such as in die-casting machines, steel mills, continuous casting machines, hot rolling mills, coking plants and other mobile and stationary hydraulic systems, excellent life-time, excellent yellow metal compatibility.
<b>RENOSAFE FireProtect 68</b>	Highest oxidation and thermal stability, excellent non-ferrous metal compatibility, hydrolytic stability and very robust and reliable wear protection. Multigrade characteristics by high, shear stable viscosity index. Biodegradable acc. to OECD 301 B >60%. Surpasses the requirements on HFDU oils acc. to ISO 12922.	919	280	68	12.6	188	-45	

# RENOLIN



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Gear and Circulating Oils</b>								
<b>RENOLIN CLP 68</b>	<b>Range RENOLIN CLP</b> High-performance gear and circulating oils with good aging stability and additives to improve corrosion protection (also combat steel and non-ferrous metal corrosion caused by moisture). Outstanding antiwear characteristics – good EP / AW performance, excellent scuffing load carrying capacity and protection against micropitting, excellent FE8 roller bearing wear protection, good demulsifying properties, very good foaming behavior, zinc-free and silicone oil-free. RENOLIN CLP oils fulfill and exceed the minimum requirements of CLP lubricating oils according to DIN 51 517-3, ISO 6743-6 and ISO 12925-1: CKC,CKD. US Steel 224, David Brown S1.53.10. Approved by leading gearbox manufactures.	886	236	68	8.7	99	-24	Universal gear oils for industrial applications such as in bearings, joints, spur gears, bevel gears and worm gears and whenever the manufacturer recommends an mineral oil of type CLP.  Approved by leading gearbox manufactures  <b>Mineral oil based</b> Demulsifying
<b>RENOLIN CLP 100</b>		890	240	100	11.2	98	-21	
<b>RENOLIN CLP 150</b>		894	250	150	14.5	96	-24	
<b>RENOLIN CLP 220</b>		896	260	220	18.9	96	-24	
<b>RENOLIN CLP 320</b>		900	255	320	24.0	95	-12	
<b>RENOLIN CLP 460</b>		901	270	460	30.4	95	-12	
<b>RENOLIN CLP 680</b>		918	270	680	36.8	88	-10	

## Industrial Oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Gear and Circulating Oils</b>								
<b>RENOLIN CLP 46 PLUS</b>	<b>Range RENOLIN CLP PLUS</b> High-performance gear and circulating oils offering excellent wear protection, good EP performance and excellent corrosion protection. Carefully selected antioxidants guarantee good ageing stability. Special detergent/dispersant additives offer very good cleaning properties and dirt carrying capacity. RENOLIN CLP PLUS oils fulfill and surpass the minimum requirements on lubricating oils acc. to DIN 51 517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD. CLP PLUS oils were developed especially for the extreme conditions, e.g. "raw material" industry, mining industry conveyors operate.	885	200	46	6.8	102	-27	Special gear oils for highly stressed mechanical industrial, spur gears, double-spur gears, bevel gears and worm gears. Long-life oils (tested and approved for 30,000 hours in brown coal open pit mining conveyors/gears).  Increased oxidation stability.  <b>Mineral oil based</b> Detergent/dispersant type
<b>RENOLIN CLP 68 PLUS</b>		888	236	68	8.7	100	-27	
<b>RENOLIN CLP 100 PLUS</b>		891	240	100	11.2	97	-24	
<b>RENOLIN CLP 150 PLUS</b>		895	250	150	14.8	97	-24	
<b>RENOLIN CLP 220 PLUS</b>		899	260	220	18.9	96	-24	
<b>RENOLIN CLP 320 PLUS</b>		899	255	320	24.0	95	-18	
<b>RENOLIN CLP 460 PLUS</b>		904	270	460	30.2	94	-14	
<b>RENOLIN CLP 680 PLUS</b>		908	270	680	39.6	95	-17	
<b>RENOLIN AWD 68</b>	<b>Range RENOLIN AWD</b> Special gear and circulating oils for highest requirements on wear protection. Special additives reduce friction and form reaction layers which offer excellent wear protection in extreme mixed friction and load conditions. Brugger value >75 N/mm <sup>2</sup> , excellent FE8 roller bearing wear protection, good dirt carrying capacity (detergent / dispersant), zinc- and silicone oil-free, high additive reserves. The RENOLIN AWD series surpasses the minimum requirements on industrial gear oils CLPD acc. to DIN 51 517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD. Approved by leading press manufacturers.	882	221	68	8.9	105	-24	For highly-stressed industrial gearboxes and circulating systems, especially when good load carrying capacity in extreme mixed friction is required, e.g. press lines in the automotive industry. High Brugger value of >75 N/mm <sup>2</sup> .  <b>Mineral oil based</b> Detergent/dispersant type
<b>RENOLIN AWD 100</b>		886	222	100	11.2	97	-24	
<b>RENOLIN AWD 150</b>		894	208	150	14.6	96	-12	
<b>RENOLIN AWD 220</b>		896	210	220	18.7	95	-12	



# RENOLIN

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Gear and Circulating Oils</b>								
<b>RENOLIN PG 32</b>	<p><b>Range RENOLIN PG</b> Fully synthetic gear and lubricating oils based on special polyalkylene glycols (PAG) for applications with extreme thermal loads. High oxidation and ageing stability, high viscosity index (shear stable), good viscosity-temperature behaviour, excellent load-carrying capacity, low coefficients of friction, high FZG, very good pitting and micropitting resistance, excellent FE8 performance.</p> <p>The oils of the RENOLIN PG series surpass the minimum requirements of CLP-PG lubricating oils according to DIN 51 517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE, (CKS), CKT. Approved by leading gearbox manufacturers.</p>	1022	220	32	7.1	194	-54	<p>For gearboxes operating in extreme thermal and mechanical conditions, such as worm gears and calander lubrication. Can also be used as compressor oils for process gases such as methane, ethane, propane, etc. due to low hydrocarbon gas solubility. Particularly suitable for steel / bronze sliding pairs in worm gears. Not miscible or compatible with mineral oils, ester oils and PAO-based oils.</p> <p><b>Based on Polyglycol, water soluble, PAG</b></p>
<b>RENOLIN PG 46</b>		1029	240	46	9.7	203	-48	
<b>RENOLIN PG 68</b>		1035	240	68	13.8	212	-51	
<b>RENOLIN PG 100</b>		1043	260	100	19.6	220	-48	
<b>RENOLIN PG 150</b>		1051	240	145	27.0	224	-51	
<b>RENOLIN PG 220</b>		1075	240	220	36.8	218	-33	
<b>RENOLIN PG 320</b>		1075	240	320	54.4	237	-36	
<b>RENOLIN PG 460</b>		1075	280	460	75.1	245	-36	
<b>RENOLIN PG 680</b>		1075	280	680	110.3	261	-33	
<b>RENOLIN PG 1000</b>		1075	280	1000	162.0	281	-36	
<b>RENOLIN UNISYN CLP 68</b>	<p><b>Range RENOLIN UNISYN CLP</b> Fully-synthetic gear and circulating oils with excellent thermal and ageing stability, very high viscosity index (shear stable), outstanding low-temperature behaviour, very good cold-flow-properties, excellent air release and low foaming tendency, good micropitting resistance, excellent FE8 performance, good demulsibility, zinc-free and silicone oil-free.</p> <p>The oils of the RENOLIN UNISYN CLP series surpass the minimum requirements on gear oils CLP-HC acc. to DIN 51 517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE, AISE 224, David Brown S1.53.101. Approved by leading gearbox manufacturers.</p>	848	240	68	10.7	147	-56	<p>For the lubrication of bearings and gearboxes with high thermal loads. RENOLIN UNISYN CLP oils are also suitable for lubricated-for-life applications and for the use in gearboxes with extended oil change intervals. Miscible and compatible with mineral oils and ester oils. Excellent low-temperature characteristics, high, shear stable viscosity index.</p> <p><b>Based on PAO (Polyalphaolefins)</b></p>
<b>RENOLIN UNISYN CLP 100</b>		851	250	100	14.5	150	-53	
<b>RENOLIN UNISYN CLP 150</b>		853	250	150	19.6	150	-45	
<b>RENOLIN UNISYN CLP 220</b>		854	260	220	26.7	155	-42	
<b>RENOLIN UNISYN CLP 320</b>		860	260	320	35.0	155	-42	
<b>RENOLIN UNISYN CLP 460</b>		861	300	460	45.6	155	-39	
<b>RENOLIN UNISYN CLP 680</b>		862	300	680	62.2	160	-33	
<b>RENOLIN UNISYN CLP 1000</b>		864	300	1000	84.0	165	-27	

## Industrial Oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Fully-synthetic High Performance Gear and Circulation Oil based on Innovative PAO (Polyalphaolefins)</b>								
<b>RENOLIN UNISYN XT 100</b>	<b>Range RENOLIN UNISYN XT</b> Fully-synthetic industrial gear oils based on new, innovative polyalphaolefins with very high, natural, shear stable viscosity index and excellent low temperature behaviour. Excellent wear protection, high micropitting resistance. RENOLIN UNISYN XT oils exceed the requirements on industrial gear oils CLP-HC acc. to DIN 51 517-3, ISO 6743-6, ISO 12925-1: CKC, CKD, CKE and AGMA 9005/E02: EP.	850	238	100	15.3	162	-48	For the use in applications with high requirements on wide temperature range. Extreme low viscosity at low temperatures.
<b>RENOLIN UNISYN XT 150</b>		850	238	150	21.4	168	-45	
<b>RENOLIN UNISYN XT 220</b>		860	242	220	29.4	174	-42	<b>Based on PAO (Polyalphaolefins)</b>  Approved by leading gearbox manufacturers.
<b>RENOLIN UNISYN XT 320</b>		860	242	320	40.2	179	-42	
<b>RENOLIN UNISYN XT 460</b>		860	242	460	54.4	188	-39	
<b>RENOLIN UNISYN XT 680</b>		860	244	680	75.5	192	-39	
<b>RENOLIN UNISYN XT 1000</b>		860	244	1000	101.0	195	-33	
<b>RENOLIN CLPF 100 SUPER</b>	<b>Range RENOLIN CLPF SUPER with MoS<sub>2</sub></b> High-pressure EP gear oils based on mineral oils with synergistic chemical EP / AW additives and physical MoS <sub>2</sub> -based solid lubricant additives. The MoS <sub>2</sub> -based solid lubricant additives cover a wide temperature range in mixed friction areas. They reduce friction and have a dampening effect. Excellent wear protection in mixed friction areas, good dirt carrying capacity, excellent foaming behaviour, very good roller bearing wear protection, zinc- and silicone oil-free. The RENOLIN CLPF SUPER oils surpass the minimum requirements on CLPD lubricating oils acc. to DIN 51 517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD	891	240	100	11.2	98	-21	For highly-loaded gearboxes, spindles, operating at low circumferential speeds and high loads, even in case of shock loading. For noise reduction and for the use in spindles and gearboxes in forging presses.
<b>RENOLIN CLPF 220 SUPER</b>		901	260	220	18.8	95	-21	
<b>RENOLIN CLPF 320 SUPER</b>		900	255	320	24.0	95	-14	
<b>RENOLIN CLPF 460 SUPER</b>		911	270	460	30.4	95	-12	<b>Mineral oil based</b> Detergent/dispersant type
<b>RENOLIN CLPF 680 SUPER</b>		922	270	680	36.8	88	-10	
<b>RENOLIN CLPF 1500 SUPER</b>		906	240	1500	70.5	104	-12	
<b>RENOLIN HighGear 220</b>	<b>Range RENOLIN HighGear*</b> RENOLIN HighGear oils are based on selected mineral oils. Synergistic additives provide outstanding wear protection of these new high-tech gear oils. Highly effective tribo-protection layers reliably protect wetted machine components against wear. This new additive technology is also referred to as a smoothening PD (plastic deformation) reaction mechanism. These additives have a noticeable smoothening effect on surface roughness. DIN 51 517-3: CLP ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE.	899	>210	220	19.0	97	-18	RENOLIN HighGear can be used both in pre-damaged gearboxes and machine components to increase service life as well as in new gearboxes (spur, bevel, planetary and worm gears) to reduce friction, wear and noise in extreme conditions.
<b>RENOLIN HighGear 320</b>		904	>210	320	24.3	97	-12	
<b>RENOLIN HighGear 460</b>		909	>210	460	30.8	97	-9	
	*Further ISO VG grades available on request.							<b>Mineral oil based</b>

# RENOLIN

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Gear and Circulating Oils</b>								
<b>RENOLIN HighGear Synth 150</b>	<b>Range RENOLIN HighGear Synth*</b> RENOLIN HighGear Synth is based on synthetic polyalphaolefins (PAO). Special synergistic additives provide outstanding wear protection of these new high-tech gear oils. Highly effective tribo-protection layers reliably protect wetted machine components against wear. RENOLIN HighGear Synth oils have a high, natural and shear stable viscosity index and are suitable for both high and low temperature applications. High thermal and oxidation stability allow oil change intervals to be extended. DIN 51 517-3: CLP-HC ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE.	871	220	150	18.0	133	-36	RENOLIN HighGear can be used both in pre-damaged gearboxes and machine components to increase service life as well as in new gearboxes (spur, bevel, planetary and worm gears) to reduce friction, wear and noise in extreme conditions. Synthetic PAO components help reduce friction, lower operating temperatures and can increase efficiency. Excellent low-temperature characteristics, high, shear stable viscosity index.  <b>Based on PAO (Polyalphaolefins)</b>
<b>RENOLIN HighGear Synth 320</b>		876	220	320	31.2	135	-34	
<b>RENOLIN HighGear Synth 460</b>		878	220	460	41.6	140	-27	
<b>RENOLIN HighGear Synth 680</b>		880	220	680	57.9	149	-27	
*Further ISO VG grades available on request.								
<b>RENOLIN MORGEAR 100</b>	<b>Range RENOLIN MORGEAR</b> High-performance circulating oils based on mineral oil, for the lubrication of MORGOIL bearings. Mild EP/AW additives provide good wear protection, synergistically acting additives ensure good ageing stability and excellent demulsibility (very good water separation). ISO 6743-6 and ISO 12925-1: CKB.	888	248	100	11.1	96	-19	For the lubrication of MORGOIL bearings. RENOLIN MORGEAR oils fulfill and surpass the requirements of DANIELI (Italy, 2000) and SMS (2005).  <b>Mineral oil based</b>
<b>RENOLIN MORGEAR 220</b>		895	255	226	19.2	96	-10	
<b>RENOLIN MORGEAR 320</b>		903	>260	320	24.0	95	-12	
<b>RENOLIN MORGEAR 460</b>		904	>270	470	31.1	96	-9	
<b>RENOLIN MORGEAR 680</b>		915	252	682	39.2	95	-7	
<b>RENOLIN SynGear 220 HT</b>	Fully-synthetic high-temperature EP industrial gear oil and calander oil based on selected polyglycols (PAG). Excellent wear protection and ageing stability. DIN 51 517-3: CLP-PG ISO 6743-6: CKC/CKD/CKT	1078	240	240	39.0	216	-36	For mechanically and thermally highly loaded wheel and worm gears / rolling and plain bearings. Especially for calanders in the paper and foil industry. Peak temperatures of 250 °C are allowed for a short time. Miscibility and compatibility properties with polyglycols of others manufacturers have to be checked.  <b>Based on PAG (Polyglycol)</b>

# Industrial Oils

# RENOLIN, RENOFUID

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Gear and Circulating Oils</b>								
<b>RENOLIN CLP 220 VCI</b>	<b>Range RENOLIN CLP VCI*</b> Special industrial gear oils based on mineral oil with excellent corrosion protection properties. Reliable long-term corrosion protection in the oil phase as well as in the vapour phase. Excellent wear protection, high scuffing protection, good compatibility with industrial gear oils. Fulfil and surpass the requirements on CLP industrial gear oils acc. to DIN 51 517-3: CLP, ISO 6743-6 and ISO 12925-1: CKC / CKD as well as AGMA 9005/E02: EP.	898	254	220	19.0	97	-24	Recommended for applications with highly loaded spur gears, bevel gears, and worm gears. Also suitable in highly loaded bearings, joint bearings and pressure spindles. Especially for gears and components which are not used for a longer period of time or are stored before they are used and therefore a conservation must be applied. Contain VCI-components (Vapor Corrosion Inhibitors).  <b>Mineral oil based</b> (VCI type)
<b>RENOLIN CLP 320 VCI</b>		900	254	320	23.0	92	-14	
<b>RENOLIN CLP 460 VCI</b>		908	246	460	30.4	95	-12	
*Further ISO VG grades available on request.								
<b>RENOLIN UNISYN GEAR 220 VCI</b>	<b>RENOLIN UNISYN GEAR 220 VCI*</b> Fully-synthetic industrial gear oil based on PAO with excellent corrosion protection properties. Reliable long-term corrosion protection in the oil phase as well as in the vapour phase. Excellent wear protection, high scuffing protection, good compatibility with industrial gear oils. Fulfil and surpass the requirements on CLP industrial gear oils acc. to DIN 51 517-3: CLP, ISO 6743-6 and ISO 12925-1: CKC / CKD as well as AGMA 9005/E02: EP.	855	260	220	26.0	160	-42	For the use in heavily loaded spur gears, bevel gears and worm gears with circulation oil system or oil injecting system. Contains VCI components (Vapor Corrosion Inhibitors).  <b>Based on PAO</b> (VCI type)
*Further ISO VG grades available on request.								
<b>RENOFLUID TF 1500</b>	EP-hydraulic- and gear oil based on high-performance base oils. With high ageing stability. FZG-Test A/8,3/90 Failure load stage > 12. DIN 51 524-2: HLP ISO 6743-4: HM	870	224	32	5.4	102	-30	Power transmission oil for VOITH-turbo gears, hydraulic oils for VOITH-turbo couplings. Also suitable as low viscosity, high-pressure gear oil especially with hydraulic controls and combined oil system.  <b>Mineral oil based</b>



## RENEP



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Slideway Oils</b>								
<b>RENEP 2 K</b>	<b>Range RENEK K</b> Solvent raffinates with special additives to reduce stick-slip especially for machine tools. Good detergency. Emulsifying. Detergent/dispersant type RENEP 2 K: CGLP 68 RENEP 4 K: CGLP 100 RENEP 5 K: CGLP 220	882	230	68	9.2	112	-27	RENEP K series products are universal products suitable for all slideway applications. They offer good EP performance, good anti-wear properties and pronounced corrosion protection. RENEK K series products display good compatibility with slide materials, very good ageing and oxidation stability and reliably combat stick-slip.
<b>RENEP 4 K</b>		885	240	100	11.8	107	-24	
<b>RENEP 5 K</b>		900	248	220	19.9	104	-12	
<b>RENEP CGLP 68</b>	<b>Range RENEK CGLP</b> With lubricity improvers and friction-reducing additives. Good EP performance. Protect against corrosion and prevent stick-slip. CGLP slideway oils according to DIN 51 502. Demulsifying. RENEP CGLP 68: CGLP 68 RENEP CGLP 150: CGLP 150 RENEP CGLP 220: CGLP 220	879	220	68	8.6	99	-24	Advanced formulation. Excellent chemical compatibility with water miscible metal working fluids. Slideway oils with very good demulsifying power, very low friction coefficient. HELLER approval. These slideway oils are especially suitable for the use with ECOCOOOL cutting fluids. Proven good compatibility with many water-miscible cutting fluids. Approved by leading machine tool manufacturers.
<b>RENEP CGLP 150</b>		892	230	150	14.8	98	-18	
<b>RENEP CGLP 220</b>		895	240	220	19.0	96	-15	
<b>RENEP KN 68</b>	<b>Range RENEK KN</b> Excellent adhesion provided by special additives which increase the adhesion to metal and plastic surfaces - "tacky" effect. Good EP performance. Protect against corrosion and prevent stick-slip. Advanced formulation. CGLP slideway oils according to DIN 51502. Demulsifying. RENEP CGLP 68: CGLP 68 RENEP CGLP 150: CGLP 150 RENEP CGLP 220: CGLP 220	882	220	67	9.1	110	-29	Excellent chemical compatibility with water-miscible metal working fluids. Slideway oils with very good demulsifying properties, low friction coefficient. Proven good compatibility with many water-miscible cutting fluids.  Approved by leading machine tool manufacturers.
<b>RENEP KN 220</b>		895	238	224	19.5	100	-17	

## Industrial Oils



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Paper Machine Oils</b>								
<b>RENOLIN PA 150</b>	<b>Range RENOLIN PA</b> Mineral oil based paper machine oils based on specially selected base oils in combination with zinc-containing EP-additives which provide an excellent wear protection. RENOLIN PA oils fulfill and exceed the minimum requirements on CLP gear oils acc. to DIN 51 517-3 and of paper machine oils for the wet end and dryer section acc. to Voith VN 108.	878	>230	150	15.0	100	-30	Recommended the use in wet end and dryer sections in paper machines, also in gearboxes, bearings in central lubricating systems as well as in applications where a lubricating oil with high thermal stability and very good ageing stability is needed, demulsifying type.  <b>Mineral oil base</b>
<b>RENOLIN PA 220</b>		886	>230	220	19.3	99	-18	
<b>RENOLIN NF PRESS 100</b>	Mineral oil based hydraulic oil based on hydrogenated mineral oils in combination with specially selected, zinc and ash-free additive technology. Specially developed for the use in hydraulic presses in paper machines. Exceeds the requirements on hydraulic oils acc. to Voith VN 108.	867	260	100	11.5	103	-36	For the use in hydraulic presses in paper machines, e.g. Voith shoe presses. Hydrogenated.  <b>Mineral oil base (group II)</b>

# RENOLIN

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Paper Machine Oils</b>								
<b>RENOLIN UNISYN CLP 150 PA</b>	<b>Range RENOLIN UNISYN CLP PA</b> Fully-synthetic, high performance paper machine oils based on polyalphaolefins. Excellent demulsibility (excellent water separation), high ageing stability, excellent wear protection and very good corrosion protection. High natural, shear stable viscosity index. Fulfill and exceed the minimum requirements of gear oils CLP HC acc. to DIN 51 517-3 and the specifications of the manufacturers FAG, Valmet, SKF and Voith VN 108.	857	>200	150	19.8	152	-39	For the use in circulating lubrication of the wet end and dryer section in paper machines, also in gearboxes and central lubricating systems.
<b>RENOLIN UNISYN CLP 220 PA</b>		859	230	220	26.5	154	-36	
<b>RENOLIN UNISYN CLP 320 PA</b>		964	>240	320	34.2	151	-32	
<b>RENOLIN UNISYN CLP 460 PA</b>		866	>240	460	46.0	156	-27	<b>Based on PAO</b>

## Industrial Oils



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Turbine Oils</b>								
<b>RENOLIN ETERNA 32</b>	<b>Range RENOLIN ETERNA</b> Turbine oils of the latest generation for lubrication of gas and steam turbines and turbo compressors (also with gear boxes, FZG ≥ 10). Based on high-quality, hydrocracked base oils. High ageing resistance, excellent protection against sludge formation. Turbine oils according to DIN 51 515 part 1 (L-TDP) and part 2 (L-TGP). Approved by SIEMENS, MAN and many other turbine manufacturers and power station operators	842	220	32	5.8	126	-15	For the lubrication of steam and gas turbines and generators, turbo compressors, pumps and transmissions. Furthermore used as lubricating and barrier oil in water-cooled generators. Surpass TDP and TGP according to DIN 51 515-1/2. AW/EP turbine oils: FZG≥10.
<b>RENOLIN ETERNA 46</b>		846	220	46	7.6	132	-15	
<b>RENOLIN ETERNA 68</b>		851	230	68	9.9	120	-15	
<b>RENOLIN ETERNA 32 SGV</b>	<b>Range RENOLIN ETERNA SGV</b> Turbine oils of the latest generation for lubricants of gas and steam turbine as well as for turbo compressor without gear boxes. Exceeds the requirements of DIN 51 515-1 (TD), DIN 51 515-2 (TG). Approved by SIEMENS, MAN and many other turbine manufacturers and power station operators, EP/AW free	838	220	32	5.8	126	-15	For the use in gas and steam turbines as well as in turbo compressors. Especially suitable for the compression of synthesis gases and ammonia. EP/AW free, highest thermal stability. Surpass TD and TG according to DIN 51 515-1/2.
<b>RENOLIN ETERNA 46 SGV</b>		846	220	46	7.6	132	-15	



# RENOLIN



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Oils for Transformers</b>								
<b>RENOLIN E 10</b>	High quality, inhibited insulating oil based on naphthenic base oils which can be used in transformers, switches, choking coils, condensers and converters. Excellent dielectric properties and high oxidation stability. Fulfills and surpasses the requirements for insulating oils according to EN 60296 as well as RWE Power Specification class I.	872	152*	10.0	–	–	-48	RENOLIN E 10 is used as insulating oil in transformers, switches, choking coils, condensers, converters and similar aggregates, also at low outdoor temperatures (e.g. in outdoor units).
<b>RENOLIN ELTEC</b>	Mineral oil-based insulating oil which can be used in transformers, converters and switch gears. Fulfills the requirements on insulating oils acc. to EN60296.	869	149*	9.9	2.4	59	-48	RENOLIN ELTEC is used as insulating oil in transformers, switch gears, inductance coils, capacitors, instrument transformers, and similar devices, even at low ambient temperatures (e.g. in outdoor installations).
<b>RENOLIN E 3</b>	Inhibited switchgear oil based on naphthenic base oils. Especially for the use in outdoor units. Fulfills the requirements according to EN 60296: 2004.	861	100*	3.2	–	–	<-70	RENOLIN E 3 is primarily used in power switches in outdoor units. Even at low ambient temperatures RENOLIN E 3 ensures an excellent flowability. Hence any additional electric heating is not necessary.

\* Acc. to Pensky Martens (P.M.)

## Industrial Oils



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Compressor Oils</b>								
<b>RENOLIN 208</b>	<b>Range RENOLIN 200</b> Ageing-resistant lubricating oils with good viscosity-temperature behaviour for normally stressed compressors, drive units as well as plain and rolling bearings. C lubricating oils according to DIN 51517 and VB lubricating oils according to DIN 51 506.	883	260	100	11.0	94	-15	Oils for all air compressors which require a DIN 51 506 VB lubricant. Also suitable as a type C circulating oil according to VDI-guideline 2202.  VB => up to 140 °C compression temperature.
<b>RENOLIN 210</b>		886	274	150	14.2	91	-9	
<b>RENOLIN 212</b>		880	290	220	18.1	90	-9	
<b>RENOLIN 213</b>		900	275	320	24.0	95	-7	
<b>RENOLIN 215</b>		904	310	510	32.5	96	-10	

# RENOLIN

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Compressor Oils</b>								
<b>RENOLIN 503</b>	<b>Range RENOLIN 500</b> Special aging-resistant lubricating oils offering minimal coking. Contain additives to improve corrosion protection and aging stability. VDL lubricating oils according to DIN 51 506. For compressor outlet temperatures up to +220 °C. 503: VDL 68 504: VDL 100 505: VDL 150 506: VDL 220	861	250	68	9.1	109	-18	Compressor oils with excellent anti-aging behavior and extremely low coking tendency. For air compressors with end temperatures up to 220 °C. Also for other thermally loaded circulation lubrication systems.
<b>RENOLIN 504</b>		866	280	100	11.9	109	-21	
<b>RENOLIN 505</b>		875	275	150	15.0	100	-15	
<b>RENOLIN 506</b>		890	280	230	18.7	90	-12	
<b>RENOLIN VDL 100 DD</b>	<b>Range RENOLIN VDL-DD</b> Lubricating oils for air compressors. Contain additives to increase corrosion protection and ageing resistance and reduce deposits (detergent/dispersant (DD) additives). VDL lubricating oils according to DIN 51 506. Surpasses intensified ageing test VDL 100 DD: VDL 100 VDL 150 DD: VDL 150	882	250	98	11.0	110	-24	Oils for all highly-stressed air compressors which require a VDL oil with DD additives, good dirt carrying capacity. Self-cleaning performance
<b>RENOLIN VDL 150 DD</b>		880	260	152	15.0	100	-12	
<b>RENOLIN SC 32</b>	<b>Range RENOLIN SC</b> Premium-quality, oxidation- and ageing-resistant special cuts with corrosion protection and Anti-Wear additives. Screw compressor fluids	871	218	32	5.4	100	-15	Mineral oil-based screw compressor oils for normal oil change intervals. For maximum discharge temperatures up to 110 °C.
<b>RENOLIN SC 46</b>		875	236	46	6.7	100	-12	
<b>RENOLIN SC 68</b>		879	251	68	8.7	99	-9	
<b>RENOLIN SC 46 MC</b>	<b>Range RENOLIN SC MC</b> Screw compressor oils based on MC oils with a high, natural Viscosity Index for extended oil change intervals.	858	230	46	6.7	100	-18	Based on hydrogenated base oils (MC). Screw compressor oils for extended oil change intervals. For maximum discharge temperatures up to 110 °C.
<b>RENOLIN SC 68 MC</b>		852	240	71	11.8	160	-24	
<b>RENOLIN COOL +</b>	Semi-synthetic screw compressor oil. Group III base oils combined with highly-efficient additive technology.	854	206	50	8.0	130	-18	High performance screw compressor oil. Extended oil change intervals even when subject to high thermal loads and/or extreme working conditions.
<b>RENOLIN VAC 100 F</b>	Special vacuum pump lubricant based on highly refined mineral oils. Does not contain any additives. Extremely low evaporation losses. Suitable for high vacuum.	887	270	102	12.1	109	-15	Can be used in minimum final pressure range from 10-3 up to 10-4 mbar. Suitable for different compressor types for example piston and rotary compressors.

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Compressor Oils</b>								
<b>RENOLIN UNISYN OL 32</b>	<b>Range RENOLIN UNISYN OL</b> Fully-synthetic cooling oils for piston and screw compressors based on polyalphaolefins with excellent oxidation stability, outstanding wear protection, good demulsification and excellent viscosity-temperature behaviour. High viscosity index. Excellent air release. Allow service intervals to be extended. Lubricating oils VDL according to DIN 51 506 and synthetic hydraulic oils according to DIN 51 524-2/3.	838	240	32	6.1	142	<-60	Fully-synthetic screw compressor oils based on PAO for extended oil change intervals even when subject to high thermal loads. Also suitable for highly loaded hydraulic systems. Excellent air release properties. Extended oil drain intervals.  <b>Based on PAO</b>
<b>RENOLIN UNISYN OL 46</b>		843	260	46	7.9	146	<-60	
<b>RENOLIN UNISYN OL 68</b>		845	260	68	10.6	144	-54	
<b>RENOLIN UNISYN OL 100</b>		849	260	100	14.2	146	-54	
<b>RENOLIN UNISYN OL 150</b>		849	250	150	19.4	148	-47	
<b>RENOLIN SE 68</b>	<b>Range RENOLIN SE</b> Fully-synthetic air compressor oils based on advanced synthetic ester technology.  Fulfills the requirements according to VDL DIN 51 506	927	264	68	9.2	111	-36	High temperature stable ester oil for use in vane type and reciprocating compressors, even under severe conditions e.g. high temperatures. Especially suited for compressors where the use of a mineral oil can lead to coking and varnish.  <b>Based on Di-Ester</b>
<b>RENOLIN SE 100</b>		971	268	100	11.1	97	-36	
<b>RENOLIN LPG 100</b>	<b>Range RENOLIN LPG</b> Synthetic gas compressor oils based on polyalkylene glycols (PAG). Suitable for process gases, refinery gases (petroleum gases) and other hydrocarbon-based gases (propane, propylene, butane, etc.) and their blends. Attention: For RENOLIN LPG 100 and LPG 185 a drying process has to be applied prior to using them as refrigeration oils.	1002	270	100	16.2	175	-39	RENOLIN LPG 100 and LPG 185 are characterized by a low solubility of hydrocarbon gases in the oil. Due to the use of special PAG base oils, the dilution of the lubricant in operation (drop in viscosity) is minimized. Thus, reliable wear protection and excellent lubricating properties are guaranteed. Selected additives provide additional security in terms of thermal-oxidative stability and wear protection of the lubricant under gas atmosphere.  <b>Based on PAG</b>
<b>RENOLIN LPG 185</b>		1012	280	185	29.0	197	-36	
<b>RENOLIN SynAir</b>	High performance synthetic air compressor fluid, excellent biodegradability according to OECD 301C > 60%. Excellent thermal and oxidation stability.	992	271	48	8.7	161	-50	For use in flooded or oil-injected screw air compressors. For applications at high temperatures to reduce oil-related residues, varnish and sludge. Extended oil drain intervals. Biodegradable acc. to OECD 301 C >60%.  <b>Based on synthetic components</b>



# RENISO



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Refrigeration Oils</b>								
<b>RENISO WF 5 A</b>	<b>Range RENISO WF</b> Special refrigeration oils for use with the refrigerant isobutane (R600a) – highly refined, low flocculation point with R600a, containing additives to improve wear protection and ageing stability. High energy efficiency. DIN 51 503 - KC, KE.	827	134	5.0	1.7	95	-45	RENISO WF refrigeration oils are recommended for the lubrication of hermetic refrigerator compressors with the refrigerant isobutane (R600a). Due to special additive systems, the RENISO WF refrigeration oils ensure the formation of a wear-protecting lubricating film at all operating temperatures. RENISO WF refrigeration oils are fully miscible with R600a and also with all other hydrocarbon refrigerants like R290.
<b>RENISO WF 7 A</b>		832	158	7.2	2.2	97	-42	
<b>RENISO WF 10 A</b>		835	172	9.6	2.6	97	-42	
<b>RENISO WF 15 A</b>		883	164	15	3.1	–	-51	
<b>RENISO KM 32</b>	<b>Range RENISO K</b> Highly refined, naphthenic mineral oils with high ageing stability, low pourpoint, excellent low-temperature behaviour and particularly good compatibility with the following refrigerants: ammonia (NH <sub>3</sub> ), HCFCs (e.g. R22), hydrocarbons (e.g. propane R290, propylene R1270). DIN 51 503 - KAA, KC, KE.	881	202	32	4.9	63	-45	For all refrigeration systems using ammonia (NH <sub>3</sub> ) or HCFC refrigerants. RENISO KES 100 is suitable for applications with high evaporation and condensation temperatures, such as air-conditioning applications, heat pumps - especially recommended for turbo compressors.
<b>RENISO KS 46</b>		894	204	46	5.8	47	-42	
<b>RENISO KC 68</b>		894	223	68	7.4	58	-39	
<b>RENISO KES 100</b>		912	218	100	8.4	20	-33	

## Industrial Oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area	
<b>Refrigeration Oils</b>									
<b>RENISO SP 32</b>	<b>Range RENISO S/SP</b> Fully synthetic refrigeration oils based on chemically and thermally stable alkyl benzenes. RENISO SP 32, 46, 100 and 220 contain highly effective AW additives ( <b>not suitable for NH<sub>3</sub> applications</b> ). Excellent miscibility and excellent stability with HCFC refrigerants (e.g. R22). DIN 51 503 - KC, KE .	881	172	32	4.6	31	-39	Particularly good miscibility with HCFC refrigerants, such as R22. Suitable for very low evaporation temperatures down to -80 °C. RENISO SP products are also recommended for use with Drop-In refrigerants (R402A/B, R401A/B, etc.). Due to their excellent stability RENISO S/SP – products are suitable for the lubrication of highly stressed refrigerant compressors. RENISO SP 220 is especially designed for the lubrication of screw compressors.	
<b>RENISO SP 46</b>		875	199	46	5.6	26	-42		
<b>RENISO SP 100</b>		871	190	100	7.9	11	-24		
<b>RENISO SP 220</b>		872	192	220	13.2	13	-27		
<b>RENISO S 3246</b>	RENISO S 3246 and RENISO S 68 <b>do not contain AW additives</b> and are suitable for use with HCFC refrigerants, hydrocarbons and NH <sub>3</sub> . DIN 51 503 - KAA, KC, KE.	877	180	40	5.1	17	-39	RENISO S 3246 and RENISO S68 – suitable for R22, hydrocarbons as well as NH <sub>3</sub> applications.  <b>Based on alkylates</b>	
<b>RENISO S 68</b>		869	188	68	6.2	-30	-33		
<b>RENISO TRITON SEZ 22</b>	<b>Range RENISO TRITON SE/SEZ</b> Fully synthetic refrigeration oils based on synthetic polyol esters - especially suitable for non-ozone depleting FC/HFC refrigerants, such as R134a, R404A, R507, R410A, R407C. Also suitable for hydrocarbon refrigerants. As polyol ester oils strongly tend to absorb water (hygroscopic behaviour), the contact of these lubricants with air (atmospheric humidity) has to be limited to a minimum. DIN 51 503 – KD, KE.	1003	248	20	4.4	133	-57	The RENISO TRITON SE/SEZ products are perfectly suited for all refrigeration circuits in which chlorine-free refrigerants (HFCs / FCs), e.g. R134a are used. RENISO TRITON SE/SEZ-refrigeration oils are recommended for hermetic, semi-hermetic and open piston compressors, as well as for screw and turbo compressors (depending on viscosity). Comprehensive tests have been performed on the use of RENISO TRITON SE/SEZ products with new refrigerants designed to replace R22, such as R422A/D and R417A.  <b>Based on polyolester (POE)</b>	
<b>RENISO TRITON SEZ 32</b>		1004	250	32	6.1	141	-57		
<b>RENISO TRITON SE 55</b>		1009	286	55	8.8	137	-48		
<b>RENISO TRITON SEZ 68</b>		970	258	68	8.9	104	-39		
<b>RENISO TRITON SEZ 80</b>		992	251	82	10.4	115	-39		
<b>RENISO TRITON SEZ 100</b>		970	266	100	11.4	100	-30		
<b>RENISO TRITON SE 170</b>		972	260	173	17.1	106	-27		
<b>RENISO TRITON SE 220</b>		976	294	220	19.0	98	-27		
<b>RENISO TRITON SEZ 320</b>		1016	278	310	33.0	148	-42		RENISO TRITON SEZ 320 is used for the lubrication of screw compressors combined with mainly R22 (also suitable for HFC).
<b>RENISO TRITON SEZ 35 SC</b>		For HFC/FC refrigerants. Specially developed for scroll compressors. DIN 51 503 – KD.	1015	256	34	6.3	138		-51

# RENISO

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Refrigeration Oils</b>								
<b>RENISO SYNTH 68</b>	Synthetic refrigeration oil based on polyalphaolefins (PAO). For NH <sub>3</sub> applications and hydrocarbon refrigerants. Also suitable for CO <sub>2</sub> (not miscible with CO <sub>2</sub> ). DIN 51 503 - KAA, KB, KE.  NSF-H1-approved acceptable as a lubricant with incidental food contact, for use in and around food processing areas.	835	260	68	10.5	142	-57	RENISO SYNTH 68 has been developed especially for the lubrication of highly stressed NH <sub>3</sub> compressors. Excellent stability with NH <sub>3</sub> . Excellent low temperature flowability, suitable for evaporation temperatures below -50 °C. Very good thermal stability. Very good lubricity also in hydrocarbon (propane R290, propylene R1270, etc.) and CO <sub>2</sub> applications (not miscible with CO <sub>2</sub> ).  <b>Based on PAO</b>
<b>RENISO UltraCool 68</b>	Refrigeration oil based on synthetic hydrocarbons. Particularly developed for ammonia applications. DIN 51 503-KAA.	854	250	62	9.1	124	-48	RENISO UltraCool 68 combines high thermal stability (no varnish, no sludge) and low evaporation rate (low oil carry-over/ low oil loss) with good elastomer compatibility (CR, HNBR, NBR).
<b>RENISO GL 68</b>	Fully synthetic refrigeration oil based on polyalkylene glycols (PAG), miscibility gap 10% oil / 90% NH <sub>3</sub> : -22°C. NH <sub>3</sub> – partly miscible refrigeration oil (Linde), also suitable for hydrocarbon applications. DIN 51 503 - KAB, KE.	1010	270	68	10.5	140	-42	RENISO PG 68 and GL 68 are ultra-dried, synthetic refrigeration oils based on PAG for NH <sub>3</sub> systems which operate on the principle of direct expansion. They differ in their miscibility with NH <sub>3</sub> . Suitable for screw and reciprocating piston compressors. RENISO PG 68 and GL 68 are also recommended for the use with hydrocarbon refrigerants.
<b>RENISO PG 68</b>	Fully synthetic refrigeration oil based on polyalkylene glycols (PAG), miscibility gap 10% oil / 90% NH <sub>3</sub> : -35 °C. NH <sub>3</sub> – partly miscible refrigeration oil, also suitable for hydrocarbon applications. DIN 51 503 - KAB, KE.	1044	250	70	14.0	210	-52	<b>Based on PAG</b>  <b>Warning:</b> PAG oils are not compatible / miscible with mineral oil. PAG oils are hygroscopic. Avoid any contamination with water. Please contact our FUCHS application engineers.
<b>RENISO PAG 46</b>	Synthetic refrigeration oils based on special polyalkylene glycols (PAG) for automotive air conditioning units with R134a.	992	240	55	10.6	187	-45	Refrigeration oils based on polyalkylene glycols for application with the refrigerant R134a used in car and truck air conditioning systems (a/c systems). RENISO PAG 100 is especially suitable for vane compressors.  <b>Based on PAG</b>
<b>RENISO PAG 100</b>	Also suitable for hydrocarbon applications. DIN 51 503 – KAB, KD, KE.	996	240	120	21.0	202	-45	
<b>RENISO PAG 1234</b> <b>NEW</b>	Synthetic refrigeration oil on the basis of double-end-capped polyalkylene glycols (PAG). For vehicle a/c systems with R1234yf. Also suitable for R134a. DIN 51 503-KD.	993	224	44	9.8	218	-45	RENISO PAG 1234 has been newly developed for car air-conditioning systems with R1234yf. The product combines both good miscibility properties and high thermo-chemical stability in contact with the refrigerant. Basic fluid and addition of RENISO PAG 1234 guarantee best lubrication properties and wear protection.

# Industrial Oils

# RENISO

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Refrigeration Oils</b>								
<b>RENISO PAG 220 C</b> "Ultra dry"	Synthetic refrigeration oil based on special, double-end capped PAGs for transcritical CO <sub>2</sub> applications (industrial and commercial applications). DIN 51 503 - KB.	1077	250	226	39.1	226	-39	Refrigeration oil based on thermally very stable, double-end capped PAGs for industrial transcritical CO <sub>2</sub> applications (particularly for air-conditioning and heat pump applications). Contains special additives to improve wear protection and ageing stability.
<b>RENISO ACC 68</b>	<b>Range RENISO ACC</b> Synthetic refrigeration oil based on special, double-end capped PAGs for transcritical CO <sub>2</sub> applications (industrial and commercial applications). DIN 51 503 - KB.	992	>220	68	14.1	215	-42	Refrigeration oil based on thermally very stable, double-end capped PAGs for industrial transcritical CO <sub>2</sub> applications (particularly for air-conditioning and heat pump applications). Contains special additives to improve wear protection and ageing stability.
<b>RENISO ACC HV</b>	<b>Based in special PAG's</b>	991	229	65	13.5	216	-45	RENISO ACC HV was developed in close collaboration with leading compressor manufacturers and OEMs specific for CO <sub>2</sub> air conditioning systems in vehicles. RENISO ACC HV is based on chemical and thermal extremely stable double end-capped PAG fluids with efficient additivation – especially with regard to wear protection.
<b>RENISO C 55 E</b>	<b>Range RENISO C</b> Synthetic refrigeration oils based on special polyol esters with anti-wear additives for use with the refrigerant CO <sub>2</sub> (subcritical and transcritical applications). Also suitable for HFC / FC refrigerants. DIN 51 503 - KB, KD.	1009	286	55	8.8	137	-48	The RENISO C products were especially developed for use in applications with the refrigerant CO <sub>2</sub> . Application fields: supermarket refrigeration equipment (subcritical deep-freeze stage of cascade systems & transcritical applications), ship cooling, as well as nearly all fields of industrial and commercial refrigeration.
<b>RENISO C 85 E</b>		993	246	80	10.6	118	-42	
<b>RENISO C 170 E</b>		976	286	178	18.5	116	-33	
<b>Based on Polyolester</b>								



# PLANTO



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Environmentally Friendly Industrial and Hydraulic Oils – Ester</b>								
<b>PLANTOHYD 15 S*</b>	<b>Range PLANTOHYD S</b> Synthetic ester oils with additives to increase aging stability. Rapidly biodegradable acc. OECD 301 B > 60%. High wear protection (FZG stage 12). Miscible and compatible with conventional, mineral oil-based hydraulic oils. HVLP according to DIN 51 524-3. Designation according to DIN ISO 15380 "HEES". 15 S: DE / 027 / 154 22 S: DE / 027 / 155 32 S: DE / 027 / 156 46 S: DE / 027 / 157 68 S: DE / 027 / 158 Awarded the EU Ecolabel (EEL).	893	200	15	4.1	191	-33	Universally recommended for hydraulic systems from -30 °C to +90 °C (oil sump temperature). The changeover guidelines according to DIN ISO 15380 must be observed.
<b>PLANTOHYD 22 S*</b>		901	200	22	5.4	198	-33	
<b>PLANTOHYD 32 S*</b>		910	206	32	7.1	194	-36	
<b>PLANTOHYD 46 S*</b>		920	300	46	9.2	187	-45	
<b>PLANTOHYD 68 S*</b>		924	300	68	12.3	181	-36	

## Industrial Oils

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Environmentally Friendly Industrial and Hydraulic Oils – Saturated Ester</b>								
<b>PLANTOSYN 32 HVI*</b>	<b>Range PLANTOSYN HVI</b> Environmentally friendly hydraulic and circulating oils based on synthetic <b>saturated esters</b> . Rapidly biodegradable acc. OECD 301 B > 60%. High wear protection, good seal and non-ferrous metal compatibility, excellent oxidation stability. Fulfills the requirements of HEES hydraulic oils according to DIN ISO 15380 and HVLP according to DIN 51 524-3. Awarded the EU Ecolabel (EEL). 32 HVI: DE / 027 / 104 46 HVI: DE / 027 / 105 68 HVI: DE / 027 / 106	915	220	32	6.2	148	-46	Suitable for all mobile and stationary hydraulic systems for which the use of a rapidly biodegradable HEES hydraulic oil according to DIN ISO 15380 is recommended (e.g. in agriculture and forestry). Can be used where unsaturated, synthetic esters have failed. Extension of oil changing intervals possible. Oil sump temperature: -30°C to 100 °C or higher. Observe DIN ISO 15380 when making changeovers. Approvals: MANNESMANN REXROTH Sauer SUNDSTRAND
<b>PLANTOSYN 46 HVI*</b>		913	280	46	8.2	150	-36	
<b>PLANTOSYN 68 HVI*</b>		916	280	68	10.6	143	-27	
<b>PLANTOLUBE POLAR 15 S</b>	<b>Range PLANTOLUBE POLAR S</b> PLANTOLUBE POLAR S oils are environmentally friendly, rapidly biodegradable fluids with extremely low pour point. Thanks to their very high VI they can be used in a wide temperature range. POLAR S oils offer outstanding protection against corrosion and wear. Highly aging resistant. Surpass the requirements of DIN 51 524-3. Miscible and compatible with mineral oil. POLAR 15 S: HVLP 15, HEES 15 POLAR 22 S: HVLP 22, HEES 22 Designation according to DIN ISO 15380	899	156	15	4.1	199	<-48	Gears, bearings, actuators used at extremely low temperatures (e.g. polar regions). Hydraulic systems operated under low temperatures can also be run with oils from the POLAR S range. The changeover guidelines according to DIN ISO 15380 must be observed.
<b>PLANTOLUBE POLAR 22 S</b>		908	166	22	5.7	200	<-51	
<b>Environmentally Friendly Synthetic Circulating and Gear Oils – Saturated Ester</b>								
<b>PLANTOGEAR 100 HVI*</b>	<b>Range PLANTOGEAR HVI</b> Environmentally friendly circulating and EP gear oils based on special saturated synthetic ester with high ageing stability, good load carrying capacity and excellent wear protection. The products PLANTOGEAR 100 HVI and 150 HVI meet and exceed the requirements according to DIN 51 517-3: CLP and AGMA 9005 / E02: EP Awarded the EU Ecolabel (EEL): 100 HVI: DE / 027/177 150 HVI: DE / 027/178	927	>270	100	–	138	-33	Universal CLP gear oils. The products are used in spur, bevel, planetary and worm gears specially in environmentally sensitive areas as well as for lubrication of drives in water protection areas, where by oil leaks groundwater and surface water could be endangered.
<b>PLANTOGEAR 150 HVI*</b>		928	>270	150	–	145	-30	

# PLANTO

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Environmentally Friendly Synthetic Circulating and Gear Oils – Saturated Ester</b>								
<b>PLANTOGEAR 220 S*</b>	<b>Range PLANTOGEAR S</b> Rapidly biodegradable high-performance gear oils on the basis of special, saturated esters. Extremely high thermal and aging stability, high viscosity index, good viscosity-temperature behavior. For low-temperature applications. Excellent self-cleaning power due to polar ester structures, reduced friction, excellent wear protection. Good FZG scuffing load carrying capacity, good protection against micropitting, outstanding FE8 performance. The PLANTOGEAR S series surpass the requirements of CLP-E lubricating oils according to DIN 51 517-3 together with DIN 51 502, AGMA 9005/E02: EP, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE. The PLANTOGEAR HVI range and PLANTOGEAR S range have been awarded the EU Ecolabel. 100 HVI: DE / 027 / 177 150 HVI: DE / 027 / 178 220 S : DE / 027 / 102 320 S : DE / 027 / 103 460 S : DE / 027 / 107 680 S : DE / 027 / 108	938	280	220	26.2	152	-30	For highly stressed spur, bevel, planetary and worm gears - above all in areas where leakages could present a hazard to soil and to ground or surface water. For both high and low application temperatures. High, shear-stable viscosity index. Can be used as a self-cleaning gear oil.
<b>PLANTOGEAR 320 S*</b>		943	280	320	35.1	155	-30	
<b>PLANTOGEAR 460 S*</b>		951	280	460	48.0	163	-30	
<b>PLANTOGEAR 680 S*</b>		958	280	680	66.0	170	-30	
<b>Environmentally Friendly Slideway Oils – Ester</b>								
<b>PLANTOLUBE CGLP 68 S</b>	<b>Range PLANTOLUBE CGLP</b> Slideway oil based on synthetic esters with very good biodegradability. Prevents stick-slip. Load-carrying capacity and wear protection are outstanding.	916	280	68	12.1	170	-33	PLANTOLUBE CGLP 68 / 220 S are designed for the use in combination with PLANTOCOOL and PLANTOCUT.
<b>PLANTOLUBE CGLP 220 S</b>		938	280	220	26.2	152	-33	
<b>Environmentally Friendly General Lubrication Oils, Tacky Oils</b>								
<b>PLANTOTAC HV 220 N</b>	<b>Range PLANTOTAC HV</b> High-quality adhesive oils based on vegetable oil, environmentally friendly and rapidly biodegradable. Adhesive oils from the PLANTOTAC HV range offer very good VT behavior and adhesive properties and excellent wear protection. 220 N: CG 220 320 N: CG 320 460 N: CG 460	955	>250	249	31.5	169	-36	Predominantly for so-called loss lubrication, such as on non-oiltight bearings, saw frames, guide ways, joints, bolts, etc.
<b>PLANTOTAC HV 320 N</b>		958	264	381	42.4	166	-27	
<b>PLANTOTAC HV 460 N</b>		977	260	460	43.3	146	-30	
<b>PLANTOTAC HV 100 S</b>	PLANTOTAC HV-N oils are based on aging-stable synthetic esters. 100 S: CG 100	924	300	100	17.5	193	-36	
<b>Environmentally Friendly Forming and Mold Release Oils</b>								
<b>PLANTO SCHALUNGSÖL N*</b>	Based on vegetable oil. Rapidly biodegradable. With additives to increase aging stability. Awarded the EU Ecolabel (EEL): DE / 027 / 150	904	194	12.04	–	–	-15	Primarily used for steel shutterings in the concrete and plastics industry. Flattening the cement surface. Special attention must be paid to compatibility with paintings and elastomers.
<b>PLANTOLUBE SCHALUNGSÖL S</b>	Synthetic ester oil with additives to increase aging stability.	886	180	4.9	–	–	-18	

## Industrial Oils



Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Cylinder Oils</b>								
<b>RENOLIN CH 500</b>	<b>Range RENOLIN CH</b> High-quality, mineral oil-based cylinder oils. Good thermal stability and low coking. Exceed the requirements of Z lubricating oils according to DIN 51 510.	929	318	965	44.0	84	-6	For steam temperatures up to 340 °C in stationary equipments, for steam machines up to 325 °C.
<b>RENOLIN CH 700</b>		927	290	2020	81.0	98	-15	For highest steam temperatures up to 380 °C, intermittent working steam machines above 325 °C. Specially for old steam locomotives.
<b>Tacky Oils</b>								
<b>RENOTAC 343</b>	<b>Range RENOTAC</b> High-quality raffinates with lubricity improvers and anti-wear agents. Good EP and adhesive performance (tackiness). Lubricants for all total-loss applications (plain bearings, slideways, guides etc.).	881	230	100	11.3	93	-21	Lubricants for point of loss lubrication, for example slideways, guide ways, slide bearings at wood, packaging and textile machines.
<b>RENOTAC 344</b>		886	245	150	15.0	100	-21	
<b>RENOTAC 345</b>		890	250	220	19.7	100	-15	<u>RENOTAC 343 and 344</u> For textile and packaging machine, food factories, wood machines including chainsaw applications. <u>RENOTAC 347</u> Machine oil for highly loaded lubrication and sawing machines.
<b>RENOTAC 347</b>		899	260	321	24.5	98	-15	

## RENOLIN, RENOTAC

Product name	Description	Density at 15 °C kg/m <sup>3</sup>	Flash point Clev. °C	Kin. visc. at 40 °C mm <sup>2</sup> /s	Kin. visc. at 100 °C mm <sup>2</sup> /s	VI	Pour-point °C	Main application area
<b>Heat Transfer Oils</b>								
<b>RENOLIN THERM 250</b>	<b>Range RENOLIN THERM</b> Heat transfer oils based on mineral oils with high thermal stability. High heat transfer coefficients.	892	154	10	2.4	50	-42	Application range: -20 °C to 250 °C (film temperature)
<b>RENOLIN THERM 320</b>		870	225	44	6.5	98	-12	Application range: -10 °C to 320 °C (film temperature)
<b>RENOLIN THERM 330 S</b>	Synthetic heat transfer oil with very high thermal stability. Mixture of low volatile alkylbenzenes.	864	225	21	4.1	87	-55	Application range: until 320 °C (film temperature)
<b>RENOLIN THERM 380 S</b>	Synthetic heat transfer oil. Extremely high thermal stability. Minimum coking tendency.	1043	200	17	–	–	-34	Application range: until 380 °C (film temperature)
<b>Special Sealing Oils for Gasometers</b>								
<b>RENOLIN GAS 68</b>	<b>Range RENOLIN GAS</b> RENOLIN GAS are special sealing oils for gasometers. They are based on carefully chosen base oils and contain efficient additives to protect the oils against oxidation and to guarantee a reliable corrosion protection. RENOLIN GAS oils show high compatibility with various gases and contain efficient anti stick-slip components.	898	232	68	7.9	78	-36	RENOLIN GAS oils can be used in various applications. They have a high pumpability and good cold flow behaviour (low pourpoints). Moreover they display very good anti stick-slip characteristics and have low friction coefficients. Especially developed for the use as sealing oils in gasometers.
<b>RENOLIN GAS 70</b>		867	245	68	9.1	113	-39	
<b>RENOLIN GAS 150</b>		880	266	150	15.4	104	-33	



# GREASES

Greases are viscous, tough to solid lubricants. By selecting suitable oils, thickeners and additives, the properties of the lubricating greases can be optimally adjusted for the most diverse applications with the corresponding experience and know-how.

For example, there are greases for high or very low temperatures, for applications in vacuum, particularly water-resistant and weatherproof, particularly pressure-resistant or capable of creep, rapidly biodegradable or particularly adhesive greases.

With the RENOLIT and PLANTO lubricating greases from FUCHS, you have one of the largest grease ranges on the market - for almost all applications and requirements and for the best possible technical and economical solutions.



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## Greases



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Multipurpose / Longlife Greases</b>								
<b>PLANTOGEL ECO 2 S</b> <small>(Spray can: PLANTO MULTISPRAY S)</small>	–	Li/Ca synth. ester	–	2	105	-40 / +120	Ecolabel 	Rapidly biodegradable EP multipurpose grease for plain and roller bearing lubrication, e.g. water turbines or in agriculture and forestry. Good pumpability in central lube systems.
<b>RENOLIT CA-LZ</b> <small>(Also available as spray can)</small>	KP2K-30 ISO-L-X- CCHB2	Calcium Mineral oil	–	2	700	-30 / +120	–	Strongly adhesive, protects from wear even under extreme conditions, very resistant to water wash-out from metallic surfaces, long-term lubrication of passenger cars and commercial vehicles, construction industry, industrial and agricultural machines
<b>RENOLIT DURAPLEX EP 1</b>	–	Li-X Mineral oil	–	1	105	-30 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO
<b>RENOLIT DURAPLEX EP 2</b>	–	Li-X Mineral oil	–	2	105	-30 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO, wheel bearings of commercial vehicles, machine tools
<b>RENOLIT DURAPLEX EP 3</b>	–	Li-X Mineral oil	–	3	105	-20 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO, wheel bearings of commercial vehicles



# RENOLIT, PLANTOGEL

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, re- commendations	Main application area
<b>Multipurpose / Longlife Greases</b>								
<b>RENOLIT FEP 1</b>	KP1N-20 ISO-L-X- BDEB 1	Lithium Mineral oil	–	1	200	-20 / +140	–	Steel mills, quarries, construc- tion equipment and forging presses
<b>RENOLIT FEP 2</b>	KP2N-20 ISO-L-X- BDEB 2	Lithium Mineral oil	–	2	200	-20 / +140	–	Steel mills, quarries, constructi- on equipment and forging pres- ses, machine tools
<b>RENOLIT FEP 25</b>	KP2-3N-20 ISO-L-X- BDEB 2-3	Lithium Mineral oil	–	2-3	200	-20 / +140	–	Steel mills, quarries, constructi- on equipment and forging pres- ses
<b>RENOLIT FLM 2</b>	KPF2N-30 ISO-L-X- CDEB 2	Lithium Mineral oil	•	2	100	-30 / +140	MAN 285 LI-PF 2	For mechanically loaded lubrica- ting points, grease with MoS <sub>2</sub> , agricultural machines, commer- cial vehicles, construction indus- try, quarries and mining, rubber and concrete factory
<b>RENOLIT GP 1</b>	K1K-30 ISO-L-X- CCEA 1	Lithium Mineral oil	–	1	110	-30 / +120	–	Ageing resistant multipurpose grease with good corrosion pro- tection properties for lubrication of plain and roller bearings, easily pumpable in central lubri- cating systems
<b>RENOLIT GP 2</b>	K2K-30 ISO-L-X- CCEA 2	Lithium Mineral oil	–	2	110	-30 / +120	–	Ageing resistant multipurpose grease with good corrosion pro- tection properties for lubrication of plain and roller bearings, easily pumpable in central lubri- cating systems
<b>RENOLIT GP 3</b>	K3K-30 ISO-L-X- CCEA 3	Lithium Mineral oil	–	3	110	-30 / +120	–	Ageing resistant multipurpose grease with good corrosion pro- tection properties for lubrication of plain and roller bearings, easily pumpable in central lubri- cating systems
<b>RENOLIT LX-PEP 2</b>	KP2N-30 ISO-L-X- CDEB 2	Li-X Mineral oil	–	2	170	-30 / +150	MAN 284 Li-H2, MB 265.1, ZF TE-ML 12, Schaeffler Gruppe, VW TL 52 147 X, Interprecise (IDC-Bearings), Deutsche Bahn	Multipurpose grease, wheel bearings of motor vehicles, roller bearings of e-motors, needle bearings of cardan shafts, plain and roller bearings, ventilator grease
<b>RENOLIT LX-PEP 3</b>	KP3N-30 ISO-L-X- CDEB 3	Li-X Mineral oil	–	3	170	-30 / +150	Interprecise (IDC-Bearings)	Multipurpose grease, wheel bearings of motor vehicles, roller bearings of e-motors, plain and roller bearings, ventilator grease
<b>RENOLIT MP</b>	KP2K-40 ISO-L-X- DCEB 2	Lithium Mineral oil	–	2	35	-40 / +120	DBL 6804.00 MB-Sheet 267.0	Multipurpose grease for lubrica- ting points in passenger cars, commercial vehicles, engines, where constant temperature does not exceed 100 °C, sliding speeds are very low and which are not exposed to high mecha- nical loads




## Greases

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, re- commendations	Main application area
<b>Multipurpose / Longlife Greases</b>								
<b>RENOLIT MP PLUS</b>	KP2K-30 ISO-L-X- CCEB 2	Lithium Mineral oil	–	2	100	-30 / +120	–	High quality EP multipurpose grease with high adhesiveness for the lubrication of plain and roller bearings. Only available in SR cartridges.

## RENOLIT, PLANTOGEL



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubricants	NLGI grade	Base oil viscosity at 40 °C [mm <sup>2</sup> /s]	Temperature range [°C]	Approvals, recommendations	Main application area
<b>Greases for Plain and Roller Bearings</b>								
<b>PLANTOGEL ECO 2 S</b> (Spray can: PLANTO MULTISPRAY S)	–	Li/Ca synth. Ester	–	2	105	-40 / +120	Ecolabel 	Rapidly biodegradable EP multipurpose grease for plain and roller bearing lubrication, e.g. water turbines or in agriculture and forestry. Good pumpability in central lube systems.
<b>RENOLIT CA-LZ</b> (Also available as spray can)	KP2K-30 ISO-L-X-CCHB2	Calcium Mineral oil	–	2	700	-30 / +120	–	Strongly adhesive, protects from wear even under extreme conditions, very resistant to water wash-out from metallic surfaces, long-term lubrication of passenger cars and commercial vehicles, construction industry, industrial and agricultural machines
<b>RENOLIT CSX 15</b>	–	CaSX Mineral oil	–	1-2	440	-20 / +180	–	For steel mills, wood pellet presses, paper mills and construction machinery etc. Optimisation regarding pumpability.
<b>RENOLIT CX-EP 1</b>	KP1N-30 ISO-L-X-CDEB 1	Ca-X Mineral oil	–	1	110	-30 / +140	–	In general suitable for high thermal and mechanical loads, especially in the chemical, rubber, tire, steel, quarry and excavation industry. Good water and salt water resistance, also resists to weak acids and caustic solutions. Easily pumpable in central lubricating systems.

# Greases

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Plain and Roller Bearings</b>								
<b>RENOLIT CX-EP 2</b>	KP2N-30 ISO-L-X- CDEB 2	Ca-X Mineral oil	–	2	110	-30 / +140	Hoesch Rothe Erde	In general suitable for high thermal and mechanical loads, especially in the chemical, rubber, tire, steel, quarry and excavation industry. Good water and salt water resistance, also resists to weak acids and caustic solutions. Easily pumpable in central lubricating systems.
<b>RENOLIT CX-HT 0</b>	–	CaSX Mineral oil	•	0	350	-20 / +160	–	Lubrication of highly loaded roller and friction bearings at high temperatures and where extremely high demands are made on corrosion protection and wear protection; e.g. construction machinery, steel mills
<b>RENOLIT CX-HT 2</b> (Spray can: RENOLIT UNILOAD)	–	CaSX Mineral oil	•	2	350	-20 / +200	–	Lubrication of highly loaded roller and friction bearings at high temperatures and where extremely high demands are made on corrosion protection and wear protection; e.g. construction equipment, steel mills or tunnel kiln cars
<b>RENOLIT CX-TOM 15</b>	–	CaSX semisynth. base oil	–	1-2	100	-40 / +160	SEW- Eurodrive	Industrial gear bearings, belt conveyors, paper machines, machine tools, mining
<b>RENOLIT CXI 2</b>	–	CaSX Mineral oil	–	2	350	-20 / +160	Ford ESA-M1C 172-A	Steel mills, mining, construction equipment; good resistance against water, weak acids and caustic solutions.
<b>RENOLIT DURAPLEX EP 1</b>	–	Li-X Mineral oil	–	1	105	-30 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO
<b>RENOLIT DURAPLEX EP 2</b>	–	Li-X Mineral oil	–	2	105	-30 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO, wheel bearings of commercial vehicles, machine tools
<b>RENOLIT DURAPLEX EP 3</b>	–	Li-X Mineral oil	–	3	105	-20 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO, wheel bearings of commercial vehicles
<b>RENOLIT FAP 502</b>	KP2N-20 ISO-L-X- BDEB 2	Li/Ca Mineral oil	–	2	500	-20 / +140	–	For high loaded plain and roller bearings with slow sliding speeds.
<b>RENOLIT FEP 1</b>	KP1N-20 ISO-L-X- BDEB 1	Lithium Mineral oil	–	1	200	-20 / +140	–	Steel mills, quarries, construction equipment and forging presses
<b>RENOLIT FEP 2</b>	KP2N-20 ISO-L-X- BDEB 2	Lithium Mineral oil	–	2	200	-20 / +140	–	Steel mills, quarries, construction equipment and forging presses, machine tools
<b>RENOLIT FEP 25</b>	KP2-3N-20 ISO-L-X- BDEB 2-3	Lithium Mineral oil	–	2-3	200	-20 / +140	–	Steel mills, quarries, construction equipment and forging presses

# RENOLIT

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Plain and Roller Bearings</b>								
<b>RENOLIT FLM 2</b>	KPF2N-30 ISO-L-X- CDEB 2	Lithium Mineral oil	•	2	100	-30 / +140	MAN 285 LI-PF 2	For mechanically loaded lubricating points, grease with MoS <sub>2</sub> , agricultural machines, commercial vehicles, construction industry, quarries and mining, rubber and concrete factory
<b>RENOLIT FLM 502</b>	KPF2N-20 ISO-L-X- BDEB 2	Li/Ca Mineral oil	•	2	500	-20 / +140	–	For high and very high loaded roller and friction bearings, slow sliding speeds
<b>RENOLIT GP 1</b>	K1K-30 ISO-L-X- CCEA 1	Lithium Mineral oil	–	1	110	-30 / +120	–	Ageing resistant multipurpose grease with good corrosion protection properties for lubrication of plain and roller bearings, easily pumpable in central lubricating systems
<b>RENOLIT GP 2</b>	K2K-30 ISO-L-X- CCEA 2	Lithium Mineral oil	–	2	110	-30 / +120	–	Ageing resistant multipurpose grease with good corrosion protection properties for lubrication of plain and roller bearings, easily pumpable in central lubricating systems
<b>RENOLIT GP 3</b>	K3K-30 ISO-L-X- CCEA 3	Lithium Mineral oil	–	3	110	-30 / +120	–	Ageing resistant multipurpose grease with good corrosion protection properties for lubrication of plain and roller bearings, easily pumpable in central lubricating systems
<b>RENOLIT H 443-HD 88</b>	–	Lithium Mineral oil	–	2-3	110	-30 / +140	RWE Rheinbraun Flender Siemens	Roller and friction bearings operating under specific high strain, in particular strain produced by shocks and vibrations e.g. in unbalanced motors, vibrating screens, vibrators, soil tampers and electrical machines. Lubrication of friction bearings via Stauffer grease cups, lubricating nipples or central lubricating systems. High loads within a wide speed range
<b>RENOLIT HI-SPEED 2</b>	KHCE2K-40 ISO-L-X- DCEA 2	Lithium synth. base oil	–	2	18	-40 / +120	–	For high-speed bearings, n x dm = 1,4 Mio, machine tools and textile spindles, electrical motor, linear guiding
<b>RENOLIT HLT 2</b>	KPHC2N-40 ISO L-X- DDEB 2	Lithium PAO	–	2	105	-40 / +140	–	For lubricating points at changing ambient temperatures and high requirements, e. g. lifetime lubrication of pneumatic applications, centrifuges, plain- and roller bearings
<b>RENOLIT JP 1619</b>	–	Lithium synth. base oil	–	1	25	-50 / +120	DBL 6804.70 VW TL 52 168 Dana Spicer Bosch MAN	EP-grease with additive for improve corrosion protection, ageing resistance and adhesiveness, lubrication of friction points requiring very good sliding behaviour, low start-up resistance, also at low temperature, e.g. rack and pinion steerings, prop shafts, high-speed bearings
<b>RENOLIT LX-PEP 1/2</b>	KP1-2N -30 ISO-L-X- CDEB 1-2	Li-X Mineral oil	–	1-2	170	-30 / +150	–	High speed gears for power tools, e.g. power drill, circular hand saw, jigsaw, etc., needle cups and length adjustments of cardan shafts, plain and roller bearings



# Greases

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommenda- tions	Main application area
<b>Greases for Plain and Roller Bearings</b>								
<b>RENOLIT LX-PEP 2</b>	KP2N-30 ISO-L-X- CDEB 2	Li-X Mineral oil	–	2	170	-30 / +150	MAN 284 Li-H2, MB 265.1, ZF TE-ML 12, Schaeffler Gruppe, VW TL 52 147 X, Interprecise (IDC-Bearings), Deutsche Bahn	Multipurpose grease, wheel bearings of motor vehicles, roller bearings of e-motors, needle bearings of cardan shafts, plain and roller bearings, ventilator grease
<b>RENOLIT LX-PEP 3</b>	KP3N-30 ISO-L-X- CDEB 3	Li-X Mineral oil	–	3	170	-30 / +150	Interprecise (IDC-Bearings)	Multipurpose grease, wheel bearings of motor vehicles, roller bearings of e-motors, plain and roller bearings, ventilator grease
<b>RENOLIT LZR 2 H</b>	KP2N-30 ISO-L-X- CDIB 2	Lithium Mineral oil	–	2	200	-30 / +160	Baier & Köppel	Premium multipurpose grease, long-term rust prevention, sealing grease, central lubricating systems, sugar refineries, roof tile factories, paper industry, prevent standstill corrosion, hytel compatible
<b>RENOLIT MP</b>	KP2K-40 ISO-L-X- DCEB 2	Lithium Mineral oil	–	2	35	-40 / +120	DBL 6804.00 MB-Blatt 267.0	Multipurpose grease for lubricating points in passenger cars, commercial vehicles, engines, where constant temperature does not exceed 100°C, sliding speeds are very low and which are not exposed to high mechanical loads
<b>RENOLIT MP PLUS</b>	KP2K-30 ISO-L-X- CCEB 2	Lithium Mineral oil	–	2	100	-30 / +120	–	High quality EP multipurpose grease with high adhesiveness for the lubrication of plain and roller bearings. Only available in SR cartridges.
<b>RENOLIT POLAR BLACK</b>	–	Lithium PAO	•	1-2	84	-50 / +140	–	Fully synthetic heavy duty all-season grease with solid lubricants for plain and roller bearings of construction machines and mining vehicles exposed to changing ambient temperatures.
<b>RENOLIT PU-FH 300</b>	KP2R-20	PU Mineral oil	–	2	500	-20 / +180	–	Lubricating points exposed to high thermal loads and bearings with slow sliding speeds (black-rubber mixers)
<b>RENOLIT PU-MA 2</b>	KPFH- C2R-40 ISO-L-X- DFEB 2	PU PAO	•	2	100	-40 / +180	–	Lubrication of electric motors, hot-air blowers, tumble dryers, black-rubber mixers, paper industry dryers, calander bearings, etc.
<b>RENOLIT S 2</b>	KE1-2G-60 ISO-L-X- EBEA 1-2	Lithium synth. ester	–	1-2	14	-60 / +100	–	Low temperature e.g. electrical motors, instruments, air traffic control systems, refrigerators, air conditioners and transmitter equipment

# RENOLIT

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Plain and Roller Bearings</b>								
<b>RENOLIT SI 400 L</b>	KSI1R-30 ISO-L-X- EFEA 1-2	Lithium Silicone oil	–	1	80	-30 / +180	–	For slightly to normally loaded roller and friction bearings in electric motors, for joints, conveyor chains, ventilators, dryers, controlling equipment, and household appliances. RENOLIT SI 400 L guarantees a good lubrication to metal/plastic pairings.
<b>RENOLIT SI 400 M</b>	KSI2R-30 ISO-L-X- EFEA 2	Lithium Silicone oil	–	2	80	-30 / +180	–	For slightly to normally loaded roller and friction bearings in electric motors, for joints, conveyor chains, ventilators, dryers, controlling equipment, and household appliances. RENOLIT SI 400 L guarantees a good lubrication to metal/plastic pairings.
<b>RENOLIT SI 511 F</b>	–	PU Silicone oil	–	0	80	-40 / +200	–	Especially suitable for re-lubrication of RENOLIT SI 511 L and SI 511 M at very high temperature
<b>RENOLIT SI 511 L</b>	–	PU Silicone oil	–	1	80	-40 / +200	–	High temperature grease, plain and roller bearings, e.g. electric motors, conveyor chains, furnace carriages, drying equipment, bearing pairs: metal/metal, metal/plastic, plastic/plastic
<b>RENOLIT SI 511 M</b>	–	PU Silicone oil	–	2	80	-30 / +220	–	High temperature grease, plain and roller bearings, e.g. electric motors, conveyor chains, furnace carriages, drying equipment, bearing pairs: metal/metal, metal/plastic, plastic/plastic
<b>RENOLIT ST-FTM 0-1</b>	–	PTFE PFPE	–	1	335	-40 / +250	–	For the lubrication of plain and roller bearings and guidances at high temperatures. Also for the lubrication of ejectors of plastic injection moulding machines and tyre heating presses. Do not mix with mineral oil products or other lubricants. The surfaces to be lubricated shall be free of residual oil and grease.
<b>RENOLIT ST-FTM 2</b>	–	PTFE PFPE	–	2	335	-40 / +250	–	For the lubrication of plain and roller bearings and guidances at high temperatures. Also for the lubrication of ejectors of plastic injection moulding machines, tyre heating presses and paint finishing systems. Do not mix with mineral oil products or other lubricants. The surfaces to be lubricated shall be free of residual oil and grease.
<b>RENOLIT ST 8-081/2</b>	–	PTFE PFPE	–	2	510	-20 / +260	–	Do not mix with other lubricants! Surfaces must be free from residual oil and grease! Fully synthetic, thermally stable, resistant to solvents (exception: halocarbon refrigerants), oxidation stable, high load carrying abilities; plain and roller bearings of all industrial sectors, e.g. enamelling lines, drying stoves, machines in the packaging industries, calander bearings, bearings of hot air and smoke gas flaps in power plants
<b>RENOLIT UNITEMP 2</b>	–	Synt. NaX PAO	–	2	180	-50 / +180	–	Plain and roller bearings at high temperatures

## Greases



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Gear Boxes</b>								
<b>RENOLIT CX-EP 0</b>	GP0N-30 ISO-L-X- CDEB 0	Ca-X Mineral oil	–	0	120	-30 / +140	–	In general suitable for high thermal and mechanical loads, especially in the chemical, rubber, tire, steel, quarry and excavation industry. Good water and salt water resistance, also resists to weak acids and caustic solutions. Easily pumpable in central lubricating systems.
<b>RENOLIT CX-HT 0</b>	–	CaSX Mineral oil	•	0	350	-20	–	Lubrication of highly loaded roller and friction bearings at high temperatures and where extremely high demands are made on corrosion protection and wear protection; e.g. construction equipment or steel mills
<b>RENOLIT CX-HT 2</b> <small>(Spray can: RENOLIT UNILOAD)</small>	–	CaSX Mineral oil	•	2	350	-20	–	Lubrication of highly loaded roller and friction bearings at high temperatures and where extremely high demands are made on corrosion protection and wear protection; e.g. construction equipment, steel mills or tunnel kiln cars
<b>RENOLIT EPLITH 00</b>	GP00K-10 ISO-L-X- ACEB 00	Lithium Mineral oil	–	00	420	-10 / +120	Müller- Weingar- ten Schuler	Lubrication of worm gears, bevel gears, spiral-toothed and straight-toothed gears, e.g. forming presses, machine tools, industrial gears

# RENOLIT

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Gear Boxes</b>								
<b>RENOLIT LZR 000</b>	GP00- 000G-40 ISO-L-X- DBIB 00-000	Li/Ca Mineral oil	–	00-000	43	-40 / +110	MB-Sheet 264.0 MAN 283 LI-P 00/000	Semi-fluid grease for central lubricating systems of commercial vehicles
<b>RENOLIT SF 7-041</b>	GP000K-30 ISO-L-X- CCEB 000	Lithium Mineral oil	–	000	110	-30 / +120	–	Machine tools, labelling and packaging machines with central lubrication systems, industrial gears.
<b>RENOLIT SO-GFB</b>	GP00H-30 ISO-LX-CB- BB 00	Sodium Mineral oil	–	00	250	-30 / +100	–	Fast rotating gears, gear motors, drum motors
<b>RENOLIT SO-GFO 35</b>	GP0H-30 ISO-L-X-CB- BB 0	Sodium Mineral oil	–	0	250	-30 / +100	–	Fast rotating gears, agricultural machines

## Greases




**RENOLIT**


Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Food Grade Greases</b>								
<b>RENOLIT G7 FG 1</b>	K2N-20 ISO-L-X- BDEA 2	Clay White oil	–	2	70	-20 / +140	NSF-H1	Multipurpose grease for the food industry
<b>RENOLIT SI 410 M</b>	KSI2K-55 ISO-L-X- ECEA 2	Calcium Silicone oil	–	2	750	-55 / +120	UBA (D), eurofins (F)	Beer tap grease for lubrication of taps, bearings and sealings of fermentation and filling plants for beverages, food plants and packaging



# PLANTOGEL



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Biodegradable Greases</b>								
<b>PLANTOGEL ECO 1 N</b>	–	Calcium Rape seed oil	–	1	36	-20 / +70	Ecolabel 	Rapidly biodegradable lubricating grease wit Ecolabel, e.g. for lock gates or in agriculture and forestry.
<b>PLANTOGEL ECO 2 N</b>	–	Calcium Rape seed oil	–	2	36	-20 / +70	Ecolabel 	Rapidly biodegradable lubricating grease wit Ecolabel, e.g. for lock gates or in agriculture and forestry.
<b>PLANTOGEL ECO 2 S</b> <small>(Spray can: PLANTO MULTISPRAY S)</small>	–	Li/Ca synth. ester	–	2	105	-40 / +120	Ecolabel 	Rapidly biodegradable EP multipurpose grease for plain and roller bearing lubri- cation, e.g. water turbines or in agricul- ture and forestry. Good pumpability in central lube systems.

## Greases



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Machine Tools</b>								
<b>RENOLIT CHUCK PASTE</b>	–	Li/Ca Mineral oil	•	2-3	166	-30 / +155	–	Chucks for machine tools and as mounting aide for gears and electrical motors, etc., ejectors of plastic injection moulding machines (up to +100 °C), prevent corrosion and fretting corrosion
<b>RENOLIT CX-EP 2</b>	KP2N-30 ISO-L-X- CDEB 2	Ca-X Mineral oil	–	2	110	-30 / +140	Hoesch Rothe Erde	In general suitable for high thermal and mechanical loads, especially in the chemical, rubber, tire, steel, quarry and excavation industry. Good water and salt water resistance, also resists to weak acids and caustic solutions. Easily pumpable in central lubricating systems.
<b>RENOLIT CX-TOM 15</b>	–	CaSX semisynth. base oil	–	1-2	100	-40 / +160	SEW- Eurodrive	Industrial gear bearings, belt conveyors, paper machines, machine tools, mining
<b>RENOLIT DURAPLEX EP 2</b>	–	Li-X Mineral oil	–	2	105	-30 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO, wheel bearings of commercial vehicles , machine tools
<b>RENOLIT EPLITH 00</b>	GP00K-10 ISO-L-X- ACEB 00	Lithium Mineral oil	–	00	420	-10 / +120	Müller- Weingar- ten Schuler	Lubrication of worm gears, bevel gears, spiral-toothed and straight-toothed gears, e.g. forming presses, machine tools, industrial gears

# RENOLIT

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Machine Tools</b>								
<b>RENOLIT FEP 2</b>	KP2N-20 ISO-L-X- BDEB 2	Lithium Mineral oil	–	2	200	-20 / +140	–	Steel mills, quarries, construction equip- ment and forging presses, machine tools
<b>RENOLIT HI-SPEED 2</b>	KHCE2K-40 ISO-L-X- DCEA 2	Lithium synth. base oil	–	2	18	-40 / +120	–	For high-speed bearings, n x dm = 1,4 Mio, machine tools and textile spindles, electrical motor, linear guiding
<b>RENOLIT PASTE PW</b>	–	CaSX Mineral oil	•	2	350	-20 / +1,200	–	Assembly paste for prevent fretting cor- rosion , e.g. gears, electrical motors, etc., chucks, superheated steam valves, bearing seats on knuckle pins, or spline connections in length adjusters of car- dan shafts
<b>RENOLIT SF 7-041</b>	GP000K-30 ISO-L-X- CCEB 000	Lithium Mineral oil	–	000	110	-30 / +120	–	Machine tools, labelling and packaging machines with central lubrication sys- tems, industrial gears.

## Greases



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubricants	NLGI grade	Base oil viscosity at 40 °C [mm <sup>2</sup> /s]	Temperature range [°C]	Approvals, recommendations	Main application area
<b>Greases for Rail Vehicles</b>								
<b>RENOLIT HLT 2</b>	KPHC2N-40 ISO L-X- DDEB 2	Lithium PAO	–	2	105	-40 / +140	–	For lubricating points at changing ambient temperatures and high requirements, e. g. lifetime lubrication of pneumatic applications, centrifuges, plain- and roller bearings
<b>RENOLIT LX-PEP 1/2</b>	KP1-2N -30 ISO-L-X- CDEB 1-2	Li-X Mineral oil	–	1-2	170	-30 / +150	–	High speed gears for power tools, e.g. power drill, circular hand saw, jigsaw, etc., needle cups and length adjustments of cardan shafts, plain and roller bearings
<b>RENOLIT LX-PEP 2</b>	KP2N-30 ISO-L-X- CDEB 2	Li-X Mineral oil	–	2	170	-30 / +150	MAN 284 Li-H2, MB 265.1, ZF TE-ML 12, Schaeffler Gruppe, VW TL 52 147 X, Interprecise (IDC-Bearings), Deutsche Bahn	Multipurpose grease, wheel bearings of motor vehicles, roller bearings of e-motors, needle bearings of cardan shafts, plain and roller bearings, ventilator grease
<b>RENOLIT LX-PEP 3</b>	KP3N-30 ISO-L-X- CDEB 3	Li-X Mineral oil	–	3	170	-30 / +150	Interprecise (IDC-Bearings)	Multipurpose grease, wheel bearings of motor vehicles, roller bearings of e-motors, plain and roller bearings, ventilator grease

# RENOLIT



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommen- dations	Main application area
<b>Greases for Extreme High Temperatures</b>								
<b>RENOLIT PU-FH 300</b>	KP2R-20	PU Mineral oil	–	2	500	-20 / +180	–	Lubricating points exposed to high thermal loads and bearings with slow sliding speeds (black-rubber mixers)
<b>RENOLIT PU-MA 2</b>	KPFH- C2R-40 ISO-L-X- DFEB 2	PU PAO	•	2	100	-40 / +180	–	Lubrication of electric motors, hot-air blowers, tumble dryers, black-rubber mixers, paper industry dryers, calander bearings, etc.
<b>RENOLIT SI 400 L</b>	KSI1R-30 ISO-L-X- EFEA 1-2	Lithium Silicone oil	–	1	80	-30 / +180	–	For slightly to normally loaded roller and friction bearings in electric motors, for joints, conveyor chains, ventilators, dryers, controlling equipment, and household appliances. RENOLIT SI 400 L guarantees a good lubrication to metal/plastic parings.
<b>RENOLIT SI 400 M</b>	KSI2R-30 ISO-L-X- EFEA 2	Lithium Silicone oil	–	2	80	-30 / +180	–	For slightly to normally loaded roller and friction bearings in electric motors, for joints, conveyor chains, ventilators, dryers, controlling equipment, and household appliances. RENOLIT SI 400 L guarantees a good lubrication to metal/plastic parings.
<b>RENOLIT SI 511 F</b>	–	PU Silicone oil	–	0	80	-40 / +200	–	Especially suitable for re-lubrication of RENOLIT SI 511 L and SI 511 M at very high temperature



## Greases

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, recom- menda- tions	Main application area
<b>Greases for Extreme High Temperatures</b>								
<b>RENOLIT SI 511 L</b>	–	PU Silicone oil	–	1	80	-40 / +200	–	High temperature grease, plain and roller bearings, e.g. electric motors, conveyor chains, furnace carriages, drying equipment, bearing pairs: metal/metal, metal/plastic, plastic/plastic
<b>RENOLIT SI 511 M</b>	–	PU Silicone oil	–	2	80	-30 / +220	–	High temperature grease, plain and roller bearings, e.g. electric motors, conveyor chains, furnace carriages, drying equipment, bearing pairs: metal/metal, metal/plastic, plastic/plastic
<b>RENOLIT ST-FTM 0-1</b>	–	PTFE PFPE	–	1	335	-40 / +250	–	For the lubrication of plain and roller bearings and guidances at high temperatures. Also for the lubrication of ejectors of plastic injection moulding machines and tyre heating presses. Do not mix with mineral oil products or other lubricants. The surfaces to be lubricated shall be free of residual oil and grease.
<b>RENOLIT ST-FTM 2</b>	–	PTFE PFPE	–	2	335	-40 / +250	–	For the lubrication of plain and roller bearings and guidances at high temperatures. Also for the lubrication of ejectors of plastic injection moulding machines, tyre heating presses and paint finishing systems. Do not mix with mineral oil products or other lubricants. The surfaces to be lubricated shall be free of residual oil and grease.
<b>RENOLIT ST 8-081/2</b>	–	PTFE PFPE	–	2	510	-20 / +260	–	Do not mix with other lubricants! Surfaces must be free from residual oil and grease! Fully synthetic, thermally stable, resistant to solvents (exception: halocarbon refrigerants), oxidation stable, high load carrying abilities; plain and roller bearings of all industrial sectors, e.g. enamelling lines, drying stoves, machines in the packaging industries, calander bearings, bearings of hot air and smoke gas flaps in power plants
<b>RENOLIT UNITEMP 2</b>	–	Synt. NaX PAO	–	2	180	-50 / +180	–	Plain and roller bearings at high temperatures

# RENOLIT


Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommen- dations	Main application area
<b>Greases for Extreme Low Temperatures</b>								
<b>RENOLIT JP 1619</b>	–	Lithium synth. base oil	–	1	25	-50 / +120	DBL 6804.70 VW TL 52 168 Dana Spicer Bosch MAN	EP-grease with additive for improve corrosion protection, ageing resistance and adhesiveness, lubrication of friction points requiring very good sliding behaviour, low start-up resistance, also at low temperature, e.g. rack and pinion steering, prop shafts, high-speed bearings
<b>RENOLIT POLAR BLACK</b>	–	Lithium PAO	•	1-2	84	-50 / +140	–	Fully synthetic heavy duty all-season grease with solid lubricants for plain and roller bearings of construction machines and mining vehicles exposed to changing ambient temperatures.
<b>RENOLIT S 2</b>	KE1-2G-60 ISO-L-X- EBEA 1-2	Lithium synth. ester	–	1-2	14	-60 / +100	–	Low temperature e.g. electrical motors, instruments, air traffic control systems, refrigerators, air conditioners and transmitter equipment
<b>RENOLIT SI 300 M</b>	MSI2P-70	Lithium Silicone oil	–	2	75	-70 / +160	DBL 6812.10 VW TL 767 X	Low temperature grease for electric and electronic equipment, precision machines, sealing grease for radial waves sealing rings, groove rings, sealing-rings; lubrication of sealing bellows
<b>RENOLIT SI 300 S</b>	MSI3P-70	Lithium Silicone oil	–	3	75	-70 / +160	–	Low temperature grease for electric and electronic equipment, precision machines, sealing grease for radial waves sealing rings, groove rings, sealing-rings
<b>RENOLIT UNITEMP 2</b>	–	Synt. NaX PAO	–	2	180	-50 / +180	–	Plain and roller bearings at high temperatures

## Greases



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubricants	NLGI grade	Base oil viscosity at 40 °C [mm <sup>2</sup> /s]	Temperature range [°C]	Approvals, recommendations	Main application area
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### Greases for Central Lubricating Systems

<b>PLANTOGEL ECO 2 S</b> (Spray can: PLANTO MULTISPRAY S)	–	Li/Ca synth. ester	–	2	105	-40 / +120	Ecolabel 	Rapidly biodegradable EP multipurpose grease for plain and roller bearing lubrication, e.g. water turbines or in agriculture and forestry. Good pumpability in central lube systems.
<b>RENOLIT LX-PEP 2</b>	KP2N-30 ISO-L-X-CDEB 2	Li-X Mineral oil	–	2	170	-30 / +150	MAN 284 Li-H2, MB 265.1, ZF TE-ML 12, Schaeffler Gruppe, VW TL 52 147 X, Interprecise (IDC-Bearings), Deutsche Bahn	Multipurpose grease, wheel bearings of motor vehicles, roller bearings of e-motors, needle bearings of cardan shafts, plain and roller bearings, ventilator grease
<b>RENOLIT LZR 000</b>	GP00-000G-40 ISO-L-X-DBIB 00-000	Li/Ca Mineral oil	–	00-000	43	-40 / +110	MB-Sheet 264.0 MAN 283 LI-P 00/000	Semi-fluid grease for central lubricating systems of commercial vehicles
<b>RENOLIT LZR 2 H</b>	KP2N-30 ISO-L-X-CDIB 2	Lithium Mineral oil	–	2	200	-30 / +160	Baier & Köppel	Premium multipurpose grease, long-term rust prevention, sealing grease, central lubricating systems, sugar refineries, roof tile factories, paper industry, prevent standstill corrosion, hytrel compatible

## RENOLIT, PLANTOGEL

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommenda- tions	Main application area
<b>Greases for Central Lubricating Systems</b>								
<b>RENOLIT POLAR BLACK</b>	–	Lithium PAO	•	1-2	84	-50 / +140	–	Fully synthetic heavy duty all-season grease with solid lubricants for plain and roller bearings of construction machines and mining vehicles exposed to changing ambient temperatures.
<b>RENOLIT SF 7-041</b>	GP000K-30 ISO-L-X- CCEB 000	Lithium Mineral oil	–	000	110	-30 / +120	–	Machine tools, labelling and packaging machines with central lubrication systems, industrial gears.

## Greases



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubricants	NLGI grade	Base oil viscosity at 40 °C [mm <sup>2</sup> /s]	Temperature range [°C]	Approvals, recommendations	Main application area
<b>Greases with Solid Lubricants</b>								
<b>RENOLIT EP X1</b>	–	Lithium Mineral oil	•	1	1050	-15 / +120	Renk CMD	Heavy duty gear coupling grease
<b>RENOLIT FLM 2</b>	KPF2N-30 ISO-L-X- CDEB 2	Lithium Mineral oil	•	2	100	-30 / +140	MAN 285 LI-PF 2	For mechanically loaded lubricating points, grease with MoS <sub>2</sub> , agricultural machines, commercial vehicles, construction industry, quarries and mining, rubber and concrete factory
<b>RENOLIT FLM 502</b>	KPF2N-20 ISO-L-X- BDEB 2	Li/Ca Mineral oil	•	2	500	-20 / +140	–	For high and very high loaded roller and friction bearings, slow sliding speeds
<b>RENOLIT FOL 2</b>	–	Lithium PAO	•	2	110	-10 / +21	MPA Stuttgart approved	Very aging resistant, grease for sliding films in engineering, low sliding speed
<b>RENOLIT LX-OTP 2</b>	–	Li-X Polyglycol	•	1-2	360	-40 / +160	MAN	Lubrication of MAN knuckle pins
<b>RENOLIT POLAR BLACK</b>	–	Lithium PAO	•	1-2	84	-50 / +140	–	Fully synthetic heavy duty all-season grease with solid lubricants for plain and roller bearings of construction machines and mining vehicles exposed to changing ambient temperatures.
<b>RENOLIT PU-MA 2</b>	KPFH-C2R-40 ISO-L-X- DFEB 2	PU PAO	•	2	100	-40 / +180	–	Lubrication of electric motors, hot-air blowers, tumble dryers, black-rubber mixers, paper industry dryers, calander bearings, etc.



# RENOLIT

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases with Solid Lubricants</b>								
<b>RENOLIT TFL 2</b>	–	Lithium PAO	•	2	110	-40 / +140	–	With PTFE, for slide-pairs with and without plastic components

## Greases


## RENOLIT



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Perfluorinated Pastes</b>								
<b>RENOLIT ST-FTM 0-1</b>	–	PTFE PFPE	–	1	335	-40 / +250	–	For the lubrication of plain and roller bearings and guidances at high temperatures. Also for the lubrication of ejectors of plastic injection moulding machines and tyre heating presses. Do not mix with mineral oil products or other lubricants. The surfaces to be lubricated shall be free of residual oil and grease.
<b>RENOLIT ST-FTM 2</b>	–	PTFE PFPE	–	2	335	-40 / +250	–	For the lubrication of plain and roller bearings and guidances at high temperatures. Also for the lubrication of ejectors of plastic injection moulding machines, tyre heating presses and paint finishing systems. Do not mix with mineral oil products or other lubricants. The surfaces to be lubricated shall be free of residual oil and grease.
<b>RENOLIT ST 8-081/2</b>	–	PTFE PFPE	–	2	510	-20 / +260	–	Do not mix with other lubricants! Surfaces must be free from residual oil and grease! Fully synthetic, thermally stable, resistant to solvents (exception: halocarbon refrigerants), oxidation stable, high load carrying abilities; plain and roller bearings of all industrial sectors, e.g. enamelling lines, drying stoves, machines in the packaging industries, calender bearings, bearings of hot air and smoke gas flaps in power plants

## DUOTAC, PLANTO, RENAX



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases in Spray Cans or Rattle Cans</b>								
<b>DUOTAC ZAHNRADSPRAY</b>	–	Wax Mineral oil	•	–	–	-20 / +150	–	Dry, tenacious lubricating film. Open gears, gear rims, racks, chains, outer lubrication of wire ropes in crane installations, excavators, agricultural machines, rack and pinion railways; to be applied in cold condition, for open toothed-wheel gearing, transportation and conveying systems in the metallurgical industry and roller mills, lubrication/conservation of drag ropes and chains, e.g. in non-metallic mineral processing, solid lubricating film up to +300 °C; Bitumen-free special lubricant with graphite
<b>PLANTO MULTISPRAY S</b> (Grease: PLANTOGEL ECO 2 S)	–	Li/Ca synth. ester	–	2	105	-40 / +120	Ecolabel 	Rapidly biodegradable EP multipurpose grease for plain and roller bearing lubrication, e.g. water turbines or in agriculture and forestry. Good pumpability in central lube systems.
<b>RENAX GLEITSPRAY</b> (Grease: RENOLIT GL 1)	–	Lithium Semi- synth. base oil	–	1	–	-30 / +140	–	Very adhesive, reduces friction and wear, protects from corrosion, temperature stable, noise-suppressing, suitable for plain and roller bearings and for gear boxes, bowden cables, guide rails, sun roofs, etc.

## Greases

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Appro- vals, re- commen- dations	Main application area
<b>Greases in Spray Cans or Rattle Cans</b>								
<b>RENOLIT CA-LZ SPRAY</b>	KP2K-30 ISO-L-X- CCHB2	Calcium Mineral oil	–	2	700	-30 / +120	–	Strongly adhesive, protects from wear even under extreme conditions, very resistant to water wash-out from metallic surfaces, long-term lubrication of passenger cars and commercial vehicles, construction industry, industrial and agricultural machines
<b>RENOLIT UNILOAD</b> <small>(Grease: RENOLIT CX-HT 2)</small>	–	CaSX Mineral oil	•	2	350	-20 / +200	–	Lubrication of highly loaded roller and friction bearings at high temperatures and where extremely high demands are made on corrosion protection and wear protection; e.g. construction equipment, steel mills or tunnel kiln cars

# RENOLIT



Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommen- dations	Main application area
<b>Assembly Pastes</b>								
<b>RENOLIT AS</b>	–	Lithium synth. base oil	–	1	3000	-20 / +140	–	Lubricating and sealing grease, reduces friction, and vibration, prevents stick-slip, resists many liquids and gases, protects from corrosion; pump bearings, ventilators, conveyors, printing machines, cleaning equipment and painting lines
<b>RENOLIT CHUCK PASTE</b>	–	Li/Ca Mineral oil	•	2-3	166	-30 / +155	–	Chucks for machine tools and as mounting aide for gears and electrical motors, etc., ejectors of plastic injection moulding machines (up to +100 °C), prevent corrosion and fretting corrosion
<b>RENOLIT LX-PG 2</b>	–	Li-X Polyglycol	–	1-2	380	-40 / +160	VW TL52150	Plain and roller bearings, guides, gears, assembly aid for brake actuator boots made of EPDM
<b>RENOLIT PASTE PW</b>	–	CaSX Mineral oil	•	2	350	-20 / +1200	–	Assembly paste for prevent fretting corrosion , e.g. gears, electrical motors, etc., chucks, superheated steam valves, bearing seats on knuckle pins, or spline connections in length adjusters of cardan shafts
<b>RENOLIT SI 300 M</b>	MSI2P-70	Lithium Silicone oil	–	2	75	-70 / +160	DBL 6812.10 VW TL 767 X	Low temperature grease for electric and electronic equipment, precision machines, sealing grease for radial waves sealing rings, groove rings, sealing-rings; lubrication of sealing bellows



## Greases

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommen- dations	Main application area
<b>Assembly Pastes</b>								
<b>RENOLIT SI 300 S</b>	MSI3P-70	Lithium Silicone oil	–	3	75	-70 / +160	–	Low temperature grease for electric and electronic equipment, precision machines, sealing grease for radial waves sealing rings, groove rings, sealing-rings
<b>RENOLIT SI 708</b>	–	HDK Silicone oil	–	2-3	310	-40 / +200	–	Assembly aid for sealings, insulation grease

# RENOLIT

Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommen- dations	Main application area
<b>Greases for Special Applications</b>								
<b>RENOLIT FOL 2</b>	–	Lithium PAO	•	2	110	-10 / +21	MPA Stuttgart approved	Very aging resistant, grease for sliding films in engineering, low sliding speed
<b>RENOLIT GL 1</b>	–	Lithium Semi- synth. base oil	–	1	–	-30 / +140	–	Very adhesive, reduces friction and wear, protects from corrosion, tempe- rature stable, noise-suppressing, sui- table for plain and roller bearings and for gear boxes, bowden cables, guide rails, sun roofs, etc.
<b>RENOLIT SI 300 M</b>	MSI2P-70	Lithium Silicone oil	–	2	75	-70 / +160	DBL 6812.10 VW TL 767 X	Low temperature grease for electric and electronic equipment, precision machines, sealing grease for radial waves sealing rings, groove rings, sealing-rings; lubrication of sealing bellows
<b>RENOLIT SI 300 S</b>	MSI3P-70	Lithium Silicone oil	–	3	75	-70 / +160	–	Low temperature grease for electric and electronic equipment, precision machines, sealing grease for radial waves sealing rings, groove rings, sealing-rings
<b>RENOLIT TFL 2</b>	–	Lithium PAO	•	2	110	-40 / +140	–	With PTFE, for slide-pairs with and without plastic components
<b>SILICONFETT 300 MITTEL BLQ</b>	MSI2P-70	Lithium Silicone oil	–	2	75	-35 / +21	MPA Stuttgart approved	Bridge bearing quality (DIN EN 1337-2)



# CUTTING FLUIDS

In modern production, the requirements for a cooling lubricant have grown considerably. Within the framework of Industry 4.0, a network of the entire value-added chain of man, machine, plant, logistics and cutting fluids shall be achieved and optimized, to enable a self-organized production using modern information and communication technology to a large extent.

For this purpose, cooling lubricant measurement data must be recorded online, evaluated and corresponding maintenance must be implemented. In order to be able to analyze the measurement data with sufficient accuracy cutting fluids of high stability are required.

FUCHS is the worldwide specialist for metalworking. Our cutting fluids can be applied safely and in a stable way. They meet all legal requirements and ensure a long service life, also with boron and biocide-free products. They stand for highest cutting performance and outstanding finish quality.



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## Cutting Fluids – Water-miscible



Product name	Con-vent. Emulsion	Semi synth. Emulsion	Solution Fully synthetic	Density at 15 °C	pH Value 5%	Mixing water Hardness	Bo-ron-free	Material Recommendations	Main application area
<b>Core Program</b>									
<b>ECOCOOL AFC 1515 BW</b>	• (EP)	–	–	0.99	9.3	S, M, H	•	Steel alloyed steel, Al*	Multi-functional metalworking fluid, especially for difficult operations such as reaming and threading
<b>ECOCOOL FERROSTAR MBF</b>	–	• (ME EP)	–	0.97	9.8	S, M, H	•	Steel alloyed steel, Al*	Metalworking fluid for general machining, in particular for special cast alloys and high-alloy steels; good cooling, wetting and flushing properties; greater economy due to low drag-out losses
<b>ECOCOOL PHH AL 5</b>	•	–	–	0.93	9.7	M, H	•	Steel alloyed steel, Al*	For roughing and precision machining, as well as the grinding of steel, aluminium, nickel and titanium materials; excellent lubricity; always maintain minimum concentration
<b>ECOCOOL R - 2030</b>	•	–	–	1.00	9.4	M	–	Steel alloyed steel, cast iron, Al*	Metalworking fluid for general machining and grinding operations; very low foaming
<b>ECOCOOL R - AFC 1515 L</b>	•	–	–	0.99	9.6	M, H	–	Steel, alloyed steel, cast iron, Al*	Metalworking fluid for general and precision machining (such as reaming); low foaming; low misting and good abrasion sedimentation properties



# ECOCOOL

Product name	Con-vent. Emul-sion	Semi synth. Emul-sion	Solution Fully syn-thetic	Densi-ty at 15 °C	pH Value 5%	Mixing water Hard-ness	Bo-ron-free	Material Recom-menda-tions	Main application area
<b>Core Program</b>									
<b>ECOCOOL R - FERROSTAR MB</b>	–	• (ME EP)	–	0.96	9.8	H	–	Steel, alloyed steel, cast iron	Metalworking fluid for general machining and grinding; excellent flushing properties; greater economy due to low drag-out losses
<b>ECOCOOL R - GRINDSTAR</b>	–	• (ME)	–	1.01	9.6	S, M	–	Steel, alloyed steel, cast iron, Al*	Metalworking fluid for general machining and grinding; very good flushing and high pH buffering properties; for soft water from 2° dH; greater economy due to low drag-out losses
<b>ECOCOOL R - VHCM</b>	–	• (ME)	–	1.01	9.6	M, H	–	Steel, cast iron	Metalworking fluid for general machining operations; greater economy due to low drag-out losses
<b>ECOCOOL S-ALU</b>	–	–	(EP)	1.06	8.3	S, M	•	Steel, alloyed steel, Al*	Fully-synthetic metalworking fluid for the most difficult machining and grinding operations on aluminium and aluminium alloys; very low foaming; suitable for high pressures and soft water; greater economy due to low drag-out losses
<b>ECOCOOL S-FC</b>	–	–	• (EP)	1.05	9.2	S, M	•	Steel, cast iron	For the grinding and machining of cast iron, also, depending on the material and tool, for threading; extremely low foaming; greater economy due to low drag-out losses
<b>ECOCOOL S-FC VW</b>	–	–	• (EP)	1.06	9.4	S, M	•	Steel, cast iron, Al*	Fully-synthetic metalworking fluid for the grinding and machining of cast iron and steel; extremely low foaming; good wetting and flushing properties; does not leave sticky residues
<b>ECOCOOL S-GFC</b>	–	–	• (EP)	1.06	9.6	S, M	•	Steel, cast iron	Fully-synthetic metalworking fluid for the grinding and machining of cast iron and steel; extremely low foaming; very low drag-out losses
<b>ECOCOOL TN 2525 HP-BFH</b>	• (EP)	–	–	0.98	9.6	M, H	•	Steel, alloyed steel, Titan, Inconel, Al*	Metalworking fluid with EP additives; universally applicable for aluminium materials, titanium and stainless steels; stable at high pressures and low foaming; aerospace approvals issued
<b>ECOCOOL TOOLSTAR S-CC-1</b>	–	–	•	1.10	8.8	S, M	•	Tungsten carbides, nonferros metals	Fully-synthetic metalworking fluid for the machining and grinding of tungsten carbides and nonferrous metals; reduces cobalt leaching and soap formation; low drag-out losses
<b>ECOCOOL VHCM-BF</b>	–	• (ME EP)	–	0.99	9.6	S, M	–	Steel, cast iron	Metalworking fluid for general machining and grinding operations; the boron-free equivalent to ECOCOOL R -VHCM; greater economy due to low drag-out losses

## Cutting Fluids – Water-miscible

Product name	Con-vent. Emulsion	Semi synth. Emulsion	Solution Fully synthetic	Density at 15 °C	pH Value 5%	Mixing water Hardness	Bo-ron-free	Material Recommendations	Main application area
<b>Machining Aluminium</b>									
<b>ECOCOOL 2520</b>	•	–	–	0.98	8.5 (10%)	S, M, H	•	Alloyed steel, nonferrous materials, Al*	High-quality, universal metalworking fluid, especially for the machining of zinc- and lead-free nonferrous metals and staining-prone aluminium; not suitable for gunmetal; outstanding lubricity; good wetting and flushing properties
<b>ECOCOOL AFC 1515 BW</b>	• (EP)	–	–	0.99	9.3	S, M, H	•	Steel, alloyed steel, Al*	Multi-functional metalworking fluid, especially for difficult operations such as reaming and threading
<b>ECOCOOL ALUSTAR BF</b>	•	–	–	0.95	8.0	M	•	Steel, alloyed steel, lead and zinc containing yellow materials, Al*	High-quality, universal metalworking fluid, especially for machining of zinc and lead containing nonferrous materials; pH neutral; outstanding lubricity; good wetting and flushing properties
<b>ECOCOOL PHH AL 5</b>	•	–	–	0.93	9.7	M, H	•	Steel, alloyed steel, Al*	High-quality, universal metalworking fluid, especially for machining of zinc- and lead-free nonferrous metals; pH neutral; outstanding lubricity; good wetting and flushing properties
<b>ECOCOOL R - 2030</b>	•	–	–	1.00	9.4	M	–	Steel, alloyed steel, cast iron, Al*	Metalworking fluid for general machining and grinding; very low foaming
<b>ECOCOOL R - AFC 1515 L</b>	•	–	–	0.99	9.6	M, H	–	Steel, alloyed steel, cast iron, Al*	Metalworking fluid for general and precision machining (for example, reaming); low foaming; low misting and good abrasion sedimentation properties
<b>ECOCOOL S-ALU</b>	–	–	(EP)	1.06	8.3	S, M	•	Steel, alloyed steel, Al*	Fully-synthetic metalworking fluid for the most demanding machining and grinding operations on aluminium and aluminium alloys; extremely low foaming; suitable for soft water and high pressures; better economy due to low drag-out losses

# ECOCOOL

Product name	Con-vent. Emul-sion	Semi synth. Emul-sion	Solution Fully syn-thetic	Densi-ty at 15 °C	pH Value 5%	Mixing water Hard-ness	Bo-ron-free	Material Recom-menda-tions	Main application area
<b>Machining Cast Iron and Low-Alloy Steels</b>									
<b>ECOCOOL FERROSTAR MBF</b>	–	• (ME EP)	–	0.97	9.8	S, M, H	•	Steel, alloyed steel, Al*	Metalworking fluid for general machining, especially for special cast iron alloys and high-alloy steels; excellent cooling, wetting and flushing; low drag-out losses
<b>ECOCOOL R - FERROSTAR MB</b>	–	• (ME EP)	–	0.96	9.8	H	–	Steel, alloyed steel, cast iron	Metalworking fluid for general machining and grinding; outstanding flushing; greater economy due to low drag-out losses
<b>ECOCOOL R - GRINDSTAR</b>	–	• (ME)	–	1.01	9.6	S, M	–	Cast iron, steel, Al*	Metalworking fluid for general machining and grinding operations; very good flushing and high pH buffering capacity; for soft water from 2 °dH; low drag-out losses
<b>ECOCOOL R - VHCM</b>	–	• (ME)	–	1.01	9.6	M, H	–	Steel, cast iron	Metalworking fluid for general machining operations; low drag-out losses
<b>ECOCOOL VHCM-BF</b>	–	• (ME EP)	–	0.99	9.6	S, M	–	Steel, cast iron	Metalworking fluid for general machining and grinding operations; boron-free equivalent to ECOCOOL R -VHCM; low drag-out losses
<b>Machining High-Alloy Steels</b>									
<b>ECOCOOL PHH AL 5</b>	•	–	–	0.93	9.7	M, H	•	Steel, alloyed steel, Al*	For roughing and precision machining as well as for the grinding of steel, aluminium, nickel and titanium materials; outstanding lubricity; always maintain minimum concentration!
<b>ECOCOOL R - AFC 1515 L</b>	•	–	–	0.99	9.6	M, H	–	Steel, alloyed steel, cast iron, Al*	Metalworking fluid for general and precision machining (for example, reaming); low foaming; low misting and good abrasion sedimentation properties
<b>ECOCOOL TN 2525 HP-BFH</b>	• (EP)	–	–	0.98	9.6	M, H	•	Steel, alloyed steel, Titan, Inconel, Al*	Metalworking fluid with EP additives; universally applicable for aluminium materials, titanium and stainless steels; high-pressure stable and low foaming; Aerospace approvals have been issued

## Cutting Fluids – Water-miscible

Product name	Con-vent. Emulsion	Semi synth. Emulsion	Solution Fully synthetic	Density at 15 °C	pH Value 5%	Mixing water Hardness	Bo-ron-free	Material Recommendations	Main Application area
<b>Machining Nonferrous Metals (Copper, Brass, Bronze, Gunmetal)</b>									
<b>ECOCOOL 2520</b>	•	–	–	0.98	8.5 (10%)	S, M, H	•	Alloyed steel, nonferrous metals, Al*	High-quality, universally applicable metalworking fluid, especially for the machining of zinc- and lead-free nonferrous metals and staining-prone aluminium; not suitable for gunmetal; excellent lubricity; good wetting and flushing
<b>ECOCOOL ALUSTAR BF</b>	•	–	–	0.95	8.0	M	•	Steel, alloyed steel, lead and zinc containing yellow materials, Al*	High-quality, universally applicable metalworking fluid, especially for the machining of zinc and lead containing nonferrous materials; pH neutral; outstanding lubricity; good wetting and flushing
<b>ECOCOOL TOOLSTAR S-CC-1</b>	–	–	•	1.10	8.8	S, M	•	Tungsten carbides, non ferrous materials	Fully-synthetic metalworking fluid for the machining of tungsten carbides and nonferrous metals; reduces cobalt leaching and soap formation; low foaming; better economy due to low drag-out losses
<b>Machining Magnesium</b>									
<b>ECOCOOL 2526 MG-DC</b>	•	–	–	0.97	9.3	H	•	Al*, Mg	High-quality, universally applicable metalworking fluid; specially developed for the machining of magnesium and aluminium; mixing water > 30 °dH; stable up to 200 °dH without deposits forming
<b>Special Products</b>									
<b>ECOCOOL GS 2000</b>	–	–	•	1.06	8-10	–	•	Cast iron, steel	Thread cutting medium for water pipes; approved by the German DVWVG; dyed red
<b>ECOCOOL TOOLSTAR S-CC-1</b>	–	–	•	1.10	8.8	S, M	•	Nonferrous metals	Fully-synthetic metalworking fluid for the machining and grinding of tungsten carbides and nonferrous metals; reduces cobalt leaching and soap formation; low foaming; low drag-out losses

# Service Additives for Cutting Fluids

# ECOCOOL

Product name	Description/ Features	Application conc. (of the final dilution) [%]	Increased corrosion protection	Increase pH value	Main application area
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## Top-up Concentrate for Water-miscible Metalworking Fluids

<b>ECOCOOL AKTIV 78</b>	EP top-up concentrate	0.5% addition to max. 2	–	–	Increases EP performance. Not for machining nonferrous metals and fully-synthetic products
<b>ECOCOOL ALKALISATOR G</b>	Primary alkanol- amine	0.1 - 0.5 steps	(•)	•	Increases pH value
<b>ECOCOOL AKTIC CU</b>	Copper deactivator	0.2 - 3	•	–	Combats the staining and greenish discolouration of nonferrous metals
<b>ECOCOOL AKTIV ALU</b>	Against alumin- ium staining	0.1 - 0.15	•	–	Avoids aluminium staining
<b>NETZMITTEL 12</b>	Wetting agent	0.05 - 0.2	–	–	Improves wetting properties
<b>ECOCOOL AKTIV CPO</b>	Corrosion protection	0.1 - 0.3	•	–	Increases the corrosion protection offered by emulsions and synthetic metalworking fluids

## Defoamers, Synergetically Matched to ECOCOOL Water-miscible Metalworking Fluids

<b>ANTIFOAM 46</b>	Si-organic compound	0.01 - 0.05 (of the concentrate)	–	–	Standard defoamer for emulsions and syn- thetic solutions
<b>ANTIFOAM 46 W</b>	Si-organic compound	0.001 - 0.01 (of the emulsion volume)	–	–	Equivalent to ANTIFOAM 46 but with solubili- zers, therefore mixes well
<b>ANTIFOAM 48</b>	Si-organic compound	0.01 - 0.05 (of the concentrate)	–	–	For use with emulsions and synthetic solutions
<b>ANTIFOAM 51</b>	Si-organic compound	0.01 - 0.05 (of the concentrate)	–	–	For use with emulsions and synthetic solutions
<b>ANTIFOAM 51 G</b>	Si-organic compound	0.001 - 0.01 (of the emulsion volume)	–	–	Equivalent to ANTIFOAM 51 but with solubili- zers, therefore mixes well
<b>ANTIFOAM LC 30 W</b>	Si-organic compound	0.001 - 0.01 (of the emulsion volume)	–	–	Mixture of various defoamers; very broad range of applications
<b>ANTIFOAM WS 1</b>	Ca hardening compounds	0.01 (of the emulsion volume)	–	–	Agents to harden water; as a rule, 0.01% increases water hardness by about 1 °dH, to a max. of 30 °dH



## Service Additives for Cutting Fluids

Product name	Application concentration (of the final dilution) [%]	Formaldehyde-free	Fungicide	Bactericide	pH value effect	Main application area
<b>Bactericides and Fungicides for the Maintenance of ECOCOOL Water-miscible Metalworking Fluids</b>						
<b>ACTICIDE OX</b>	0.1 - 0.15	–	–	•	•	Formaldehyde-release agent
<b>TROY SHIELD PA 10</b>	0.1 - 0.2	•	•	–	–	Fungicide for emulsions
<b>ACTICIDE WB 200</b>	0.02 - 0.05 max. 0.1	•	•	–	–	Fungicide for emulsions and synthetic solutions
<b>ACTICIDE MBS</b>	0.1 - 0.2	•	•	•	–	Combination of fungicide and bactericide for emulsions and synthetic solutions

## Neat Cutting Fluids

## ECOCUT



Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C	Flash point [°C]	Steel	High-Alloy Steel	Aluminium	Copper, Copper Alloys	Main application area
<b>ECOCUT 3000 Series</b>								
ECOCUT 3010	11	0.84	160	•	–	•	•	Multipurpose cutting oil; low misting; copper inactive; for general machining; universally applicable for cutting and grinding; Viscosities 32 and 46 also suitable as hydraulic oils
ECOCUT 3022	22	0.86	180	•	–	•	•	
ECOCUT 3032	32	0.87	210	•	–	•	•	
ECOCUT 3046	45	0.88	220	•	–	•	•	
<b>ECOCUT HFN Series</b>								
ECOCUT HFN 5 LE-HC	4	0.83	136	•	–	•	•	Multipurpose cutting oil; low evaporation and low misting; copper-inactive; for grinding and cutting operations with geometrically-defined cutting-tools. The low-viscosity versions (5 & 10) are also suitable for honing; the higher viscosities can be used as multi-functional oils (HLP hydraulic oils)
ECOCUT HFN 10 LE-HC	10	0.84	170	•	–	•	•	
ECOCUT HFN 16 LE	15	0.86	200	•	–	•	•	
ECOCUT HFN 22 LE	22	0.85	212	•	–	•	•	
ECOCUT HFN 32 LE	30	0.85	200	•	–	•	•	

# Neat Cutting Fluids

# ECOCUT

Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C	Flash point [°C]	Steel	High-Alloy Steel	Aluminium	Copper, Copper Alloys	Main application area
<b>ECOCUT FT Series Containing GTL-Base Oil</b>								
ECOCUT FT 10 HFN	10	0.82	181	•	–	•	•	Special machining oils containing GTL base oils (Fischer-Tropsch process) for grinding and for chip-forming machining operations. Particularly high flashpoint and low evaporation
ECOCUT FT 10 HES	10	0.83	196	•	•	(•)	(•)	
ECOCUT FT 13 HFN	13	0.83	194	•	–	•	•	
<b>ECOCUT 500 Series</b>								
ECOCUT 515	15	0.90	158	•	•	–	–	Cutting oils with high EP additive content for machining operations and especially thread cutting on high-alloy steels (stainless steels). Lower viscosities highly suitable for deep hole drilling
ECOCUT 522	24	0.90	204	•	•	–	–	
ECOCUT 532 LE	30	0.88	200	•	•	–	–	
<b>ECOCUT 600 Series</b>								
ECOCUT 610 A	10	0.85	160	•	•	–	–	Neat cutting oils universally applicable for the most machining operations with defined edge in alloyed steels. Special additives with geometrically-defined cutting edges reduce the friction and increase the tool life. Low misting, chlorine- and zinc-free.
ECOCUT 615 LE	16	0.88	210	•	•	–	–	
ECOCUT 615 A	17	0.87	200	•	•	–	–	
ECOCUT 628 LE	26	0.86	210	•	•	–	–	
<b>ECOCUT 700 Series</b>								
ECOCUT 710 LE	10	0.87	158	•	•	–	–	High performance oils with high EP additive content and universally applicable for operations on high-alloy steels (Cr-Ni steels) in gear machining such as gear hobbing, broaching and deep hole drilling. Low misting, chlorine- and zinc-free
ECOCUT 715 LE	17	0.89	200	•	•	–	–	
ECOCUT 717 LE	17	0.89	200	•	•	–	(•)	
ECOCUT 720 LE	21	0.89	210	•	•	–	–	
ECOCUT 732 LE	32	0.88	190	•	•	–	–	
<b>ECOCUT 800 Series</b>								
ECOCUT 832	29	0.92	180	•	•	–	–	Broaching and special oils for very difficult machining processes and operations on high-alloy (also stainless) steels; particularly for the vertical and horizontal broaching of gear teeth and keyways. Low-misting; zinc-free; high EP additive content
ECOCUT 8532	32	0.94	210	•	•	–	–	
ECOCUT 8535 S	36	0.97	200	•	•	–	–	

## Cutting Fluids

## PLANTOCUT

Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C	Flash point [°C]	Steel	High-Alloy Steel	Aluminium	Copper, Copper Alloys	Main application area
<b>PLANTOCUT Series – Environmentally Friendly Metalworking Fluids</b>								
PLANTOCUT 10 SR	10	0.86	206	•	•	•	•	Rapidly biodegradable, ester-based cutting oil. High EP additive content, therefore particularly suitable for operations with geometrically-defined cutting edges such as turning, milling, drilling, etc. Low evaporation and low misting; H304-free
PLANTOCUT 22 SR	22	0.90	215	•	•	•	•	
PLANTOCUT 40 SR	40	0.92	216	•	•	•	•	
PLANTOCUT 18 S-CS	38	0.93	200	•	•	–	–	

## PLANTO MIKRO, ECOCUT MIKRO

Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C	Flash point [°C]	Steel	High-Alloy Steel	Aluminium	Copper, Copper Alloys	Main application area
<b>Minimum Quantity Lubrication (MQL)</b>								
PLANTO Micro 40 SR	40	0.92	216	•	•	•	•	Rapidly biodegradable, ester-based, high EP level minimum quantity lubrication oil, universally applicable for all materials including titanium and titanium alloys. Low evaporation and low misting; can be used with diverse application systems
PLANTO Micro UNI	15	0.88	200	•	•	•	•	
ECOCUT Micro PLUS 20	27	0.84	188	•	•	•	•	Minimum quantity lubrication oils based on fatty alcohols; evaporate with almost no residues. Suitable for all application systems
ECOCUT Micro PLUS 82	20	0.84	172	•	•	•	•	

## Neat Cutting Fluids

Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C	Flash point [°C]	Cutting alloy	HSS Steel	Main application area
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### Specific Application – Tool grinding

<b>ECOCUT TOOLSTAR M-CC-7</b>	7.6	0.84	154	•	•	Mineral oil-based grinding oil, universally applicable for the grinding and sharpening of HSS and tungsten carbide tools; low aromatic content; combats cobalt solubility; suitable for micro-filtering systems
<b>ECOCUT TOOLSTAR M-CC-4</b>	4	0.81	134	•	•	Mineral oil-based machining fluid for the grinding of tungsten carbides and HSS with CBN or diamond wheels; low aromatic content; combats cobalt solubility, suitable for micro-filtering systems
<b>ECOCUT TOOLSTAR P-CC-6</b>	5.5	0.80	160	•	•	PAO-based machining fluid, universally applicable for the grinding and sharpening of HSS and tungsten carbide tools; low aromatic content; combats cobalt solubility, suitable for micro-filtering systems

Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C	Flash point [°C]	Steel	High-Alloy Steel	Aluminium	Copper, Copper Alloys	Main application area
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### Specific Application – Gear Machining

<b>ECOCUT 628 LE</b>	26	0.86	210	•	•	–	–	Universally applicable for all gear machining operations (shaving, hobbing, shaping, etc)
<b>ECOCUT 720 LE</b>	21	0.89	210	•	•	–	–	
<b>ECOCUT HFN 13 LE UNI</b>	13	0.85	194	•	•	•	•	Universally applicable for gear machining and grinding. Approved by the leading grinding machine manufacturers; low misting and low evaporation; available in other viscosities on request. Available in a H 304 version as ECOCUT HFN 13 LE CLP
<b>ECOCUT HSG 211 LE</b>	11	0.84	172	•	•	•	•	High-performance grinding oil for gear grinding. Approved by the leading grinding machine manufacturers. Low misting and low evaporation

### Specific Application – Spark Erosion

<b>ECOCUT FE</b>	4	0.81	134	•	•	•	•	Dielectric medium, especially for roughing; free of aromatics
<b>ECOCUT 1520</b>	2,3	0.82	101	•	•	•	•	Dielectric, can be used for roughing as well as for finishing. Despite lower viscosity high flash point >100 °C

### Specific Application – Threading

<b>ECOCUT 522</b>	24	0.89	204	•	•	–	(•)	Solvent raffinate with chlorine-free EP additives; low misting and zinc-free. Especially for the threading of stainless steels and other machining operations on high-alloy materials
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## ECOCUT

Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C	Flash point [°C]	Steel	High-Alloy Steel	Aluminium	Copper, Copper Alloys	Main application area
<b>Specific Applications – Honing, Finishing</b>								
ECOCUT HFN 5 LE-HC	4	0.84	136	•	(•)	•	•	Honing oil for steel and cast iron; also suitable for super-finishing and high-performance honing operations
ECOCUT GBS 5	5	0.83	150	•	(•)	•	•	For grinding and honing of balls and races in the roller bearing industry
ECOCUT FE	4	0.81	134	•	•	•	•	Machining medium for honing and finishing; based on white oils and free of aromatics
<b>Specific Application – Lapping</b>								
ECOCUT HO 74	4	0.84	128	•	•	•	•	Universal lapping oil for all materials and for use with commonly-used lapping powders
<b>Specific Application – Deep Hole Drilling</b>								
ECOCUT MX 10	10	0.86	178	•	•	•	•	Mineral oil-based machining medium with EP additives for deep hole drilling; also suitable for nonferrous metals; conducting a suitability trial is recommended
ECOCUT 717 LE	17	0.89	200	•	•	–	•	
ECOCUT MXB 18	16	0.90	180	•	•	–	–	Mineral oil-based, low-misting machining medium with EP and AW additives for deep hole drilling; especially for the most difficult-to-machine materials; also suitable for drilling fuel injection holes; not suitable for nonferrous metals

## Service Additives for Neat Cutting Fluids

Product name	Kin. visc. at 40 °C [mm <sup>2</sup> /s]	Copper active	Application concentration [%]	Main application area
<b>Adjusting Concentrate for Cutting Oils</b>				
ECOCUT PLUS AN- NTN	75	–	1 - 2	Adjusting concentrate to reduce oil misting
ECOCUT PLUS KWU	36	•	1 - 100	Adjusting concentrate to improve cutting performance, tool life and surface finish
ECOCUT PLUS 800	27	•	1 - 100	Adjusting concentrate to improve cutting performance, tool life and surface finish; especially for the ECOCUT 800 Series
ECOCUT PLUS HK	32	–	1 - 100	Special adjusting concentrate for the PLANTOCUT Series when copper-inactivity is necessary



# QUENCHING FLUIDS

Particularly in the field of heat treatment, fluids play a central role. Only if the optimum quenchant is selected, can the required microstructure and strength be achieved.

Any change to the quenching rate has an effect on the microstructure, on the properties of the material and thus on its later use.

Apart from the selection of the right quenchant, precise control over the corresponding process parameters is crucial for optimum heat treatment results. Only the perfect matching of all the hardening process parameters can guarantee consistent and warp-free heat treatment results.

Trust a partner who understands all the facets of heat treatment, who is glad to advise you and who can offer you the very best system solutions for perfect results.





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## Quenching Fluids

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# Quenching Fluids

Product name	Kin. Visc. at 40 °C mm <sup>2</sup> /s	Density at 15 °C	Flash-point	Temperature range Bath temperature [°C]	Main application area
<b>Bright Quenching Oils</b>					
<b>THERMISOL QB 32</b>	31	0.87	225	50 – 90	For heat treatment of tool steels and for quenching process following the nitrocarburizing (Tenifer treatment) in salt baths.
<b>THERMISOL QB 46</b>	41	0.88	220	50 – 100	Heat treatment of alloyed tool and case hardening of steels selected for their ease of hardening. Mainly used in open quenching baths.
<b>High-performance Products based on Mineral Oil</b>					
<b>THERMISOL QH 10</b>	11	0.85	178	50 – 80	Tempering of forged components and semi-finished parts; mainly used in open baths
<b>THERMISOL QH 25</b>	21	0.86	196	50 – 100	Universal hardening oils for the heat treatment of alloyed and unalloyed case-hardening, tempering and tool steels. For open and closed baths
<b>THERMISOL QH 40</b>	42	0.87	216	50 – 110 (max. 150)	
<b>THERMISOL QH 55</b>	48	0.87	220	50 – 110 (max. 150)	For the hardening of tool steels and high-alloy tempering steels. Suitable for open and closed lines
<b>High-performance, Hydrocracked-based Products</b>					
<b>THERMISOL QH 10 MC</b>	11	0.83	162	50 – 80	Hardening and case-hardening of forged components and semi-finished parts. Mainly used in continuous, open bath lines
<b>THERMISOL QH 30 MC</b>	26	0.84	220	50 – 100 (max. 150)	For the hardening of alloyed and unalloyed case-hardening, tempering and tool steels. Suitable for use in continuous, open and closed bath lines for continuous process
<b>THERMISOL QH 40 MC</b>	40,7	0.84	236	50 – 110 (max. 170)	For the hardening of tool steels and high-alloy heat-treatable steels. Suitable for use in continuous process in open and closed bath lines
<b>Tempering Oils</b>					
<b>THERMISOL QH 80</b>	78	0.88	242	50 – 160 (max. 190)	High-performance, warm-bath quenching oils. For the hardening of tool steels and high-alloy heat-treatable steels. Suitable for open and closed lines
<b>THERMISOL QH 120</b>	120	0.90	252	50 – 170 (max. 200)	
<b>THERMISOL QWA 460</b>	467	0.90	300	150 – 200 (max. 275)	
<b>Synthetic High-performance Quenching Oils and High-performance Hot-bath Quenchants</b>					
<b>THERMISOL QHY 10</b>	11	0.87	204	50 – 130	Heat treatment of, for example, screws, springs, chains, hand tools, gearbox components, roller bearings and bulk components which are difficult to harden. Also for diverse applications in open and closed lines
<b>THERMISOL QHY 150</b>	148	0.93	316	60 – 260	

# THERMISOL

Product name	Kin. Visc. at 40 °C mm <sup>2</sup> /s	Density at 15 °C	pH value 5%	Refractometer Factor	Main application area
<b>Water-miscible Quenching Concentrates</b>					
<b>THERMISOL QZS 700</b>	125	1.1	9.0	1.7	Induction and flame hardening and for quenching by flooding. For free-cutting steels, low-alloy forged components as well as for low or unalloyed materials
<b>THERMISOL QZS 700 K</b>	159	1.1	8.9	1.6	
<b>THERMISOL QZS 400</b>	430	1.1	9.0	1.8	For induction and flame hardening and for the quenching by flooding or submersion of free-cutting steels, low-alloy forged components as well as for low or unalloyed materials. Can be used as a substitute for low-viscosity hardening oils. Good washability.
<b>THERMISOL QZS 300 ALU</b>	300	1.08	8.5	2.4	Polymer quenchant for induction and flame hardening of aluminium
<b>THERMISOL QZS 150 MM</b>	320	1.0	9.6 (10%)	4.5	Submersion quenching of free-cutting steels, low-alloy forged components and low or unalloyed materials. Can be used as a substitute for low-viscosity hardening oils. Good washability.
<b>THERMISOL QZS 550</b>	451	1.0	9.6 (10%)	4.6	Submersion quenching of high-alloy forged components and materials. Can be used as a substitute for high-viscosity hardening oils



# CLEANER

During the manufacturing process, the surface of a workpiece comes into contact with a wide variety of substances. Although these facilitate processing, their residues can cause errors and errors during subsequent processing.

The cleaning of semi-finished products and intermediates is necessary to remove residues, abrasions and impurities from previous work steps. Only then the parts will have the required degree of purity for subsequent operations or storage.

The RENOCLEAN product range from FUCHS offers cleaners for a large number of different processes and applications, and ensures convincing cleaning performance with high efficiency.





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**Cleaner**

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# Cleaner

Product name	Function	Materials	Comments	Corrosion protection, chip/filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Neutral Cleaner</b>									
<b>RENOCLEAN VR 1948</b>	Neutral cleaner for spray and high-pressure cleaning up to 300 bar, salt-free	Fe, Al, Zn, (Cu, Brass) <sup>1</sup> , Plastics <sup>1</sup>	High pressure suitable; without turbidity point	Temporary, '3% / 10 °dH	8.3 ± 0.3 at 3.5%	1 - 5	60 (20 - 80)	300	1075 ± 10
<b>RENOCLEAN VR 1862</b>	Neutral cleaner for immersion and ultrasonic cleaning, salt free	Fe, Al, Zn casting, (Cu, Brass) <sup>1</sup> , Plastics <sup>1</sup>	Suitable for polished zinc die casting; contains fragrances	Temporary, '10% (3/3) / DIN water (20 °dH)	8.3 ± 0.3	0,5 - 10	50 (20 - 60)	–	1020 ± 10
<b>RENOCLEAN WSO 3005</b>	Neutral cleaner for spray application, salt free	Fe, Al, Zn, (Cu, Brass) <sup>1</sup> , Plastics <sup>1</sup>	Mild alkaline version of RC VR 1021! E. g.: can be used before heat treatment	Temporary, '4.0% / DIN water (20 °dH)	9.2 ± 0.3 at 4%	1 - 3	50 (30 - 80)	25	1045 ± 10
<b>RENOCLEAN VR 1021 DGI</b>	Neutral cleaner for spray and high pressure application up to 600 bar, containing boron	Fe, Al, Brass, Cu	Contains phosphates and boramines, high pressure resistant VW approval A29 2936. Highly demulsifying, virtually foam-free from 25 °C upwards	Temporary, '10% / 10 °dH	9.2 at 3.5%	1 - 5	50 (10 - 80)	600	1076 ± 10
<b>RENOCLEAN MSO 3011</b>	Neutral cleaner for spray and high-pressure cleaning, deburring, salt-free	Fe, Al, Brass, Cu	High pressure suitable, boron-free new development for RC VR 1021 DGI! Highly demulsifying, virtually foam-free from 25 °C upwards	Temporary, '2.5% / 10 °dH	9.2 at 3.5%	1 - 5	50 (10 - 80)	600	1064 ± 10
<b>RENOCLEAN VR 1021 C</b>	Spray cleaner for high-pressure cleaning and high-pressure deburring systems	Fe, Al	Contains phosphates, suitable for high pressure applications VW approval A29 2862. Demulsifying adjusted, nearly foam-free from 30 °C	Temporary, '2.5% / 10 °dH	9,2 ± 0.3	1 - 5	65 (30 - 80)	30 / HD 350	1082 ± 12
<b>RENOCLEAN MTO 3002</b>	Neutral cleaner for spray, pressure flood, high-pressure cleaning and deburring, salt-free	Fe, Al, Brass, Cu, (Al, Mg) <sup>1</sup>	Residue formation very low, very good temporary corrosion protection. Neutral cleaner and corrosion protection "All-in-one", low-foam application from 20 °C, pressure-dependent	Temporary, '2% / 10 °dH	9.4 ± 0.4	1 - 5	60 (20 - 80)	500 (above 50 °C)	1090 ± 10
<b>RENOCLEAN MTO 3001</b>	Neutral cleaner for spray, immersion, pressure flood and ultrasonic cleaning, salt-free	Fe, Al, Zn, (Cu, Brass) <sup>1</sup> , Plastics <sup>1</sup>	Residue formation very low, salt-free. Universally applicable, e. g. before heat treatment, low-foam application from 30 °C, sprayable from ~ 45 °C	Temporary, '2% / in DI water	9.6 ± 0.3	1 - 5	65 (30 - 80)	25	1027 ± 10

# RENOCLEAN

Product name	Function	Materials	Comments	Corrosion protection, chip/filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Neutral Cleaner</b>									
<b>RENOCLEAN MSO 3004</b>	Neutral cleaner for spray and high-pressure cleaning up to 500 bar, salt-free	Fe, Al, Brass, Cu	Suitable for microfiltration, salt free, very low residue formation, suitable for high pressure applications. E. g.: can be used before heat treatment, almost free of foam from 10 °C onwards	Temporary, '2% / in DI water	9.8 ± 0.4	1 - 5	60 (10 - 80)	500 (above 50 °C)	1038 ± 10
<b>RENOCLEAN MSA 3011</b>	Neutral cleaner for spray, pressure flood, high-pressure cleaning and deburring, salt-free	Fe, Al, Brass, Cu, Mg	Contains hydroxides, suitable for high pressure. PSA approval worldwide: MABEC-code Z 000 533 700. Foam-free from 20 °C, depending on pressure and temperature	Temporary, '2.5 % / 10 °dH	9.8 ± 0.3	1 - 5	60 (20 - 80)	500 (above 50 °C)	1046 ± 10
<b>RENOCLEAN VR 1021 CXV</b>	Neutral cleaner for spray, flood and high pressure cleaning	Fe, Al, Brass, Cu, Mg	Contains hydroxides, suitable for high pressure. VW approval A29 0976. High pressure cleaning (200 bar, 300 short term), nearly foam-free from 30 °C upwards	Temporary, '2% / 10 °dH	9.8 ± 0.3	1 - 5	65 (30 - 80)	200 (300 short term)	1053 ± 10
<b>RENOCLEAN VR 1021 CXV+</b>	Neutral cleaner for spray, flood and high pressure cleaning	Fe, Al, Brass, Cu, Mg	Contains hydroxides, suitable for high pressure. VW approval A29 0976. High pressure cleaning (100 bar, 200 short term), nearly foam-free from 30 °C	Temporary, '2% / 10 °dH	9.8 ± 0.3	1 - 5	65 (30 - 80)	100 (200 short term)	1049 ± 10
<b>RENOCLEAN VR 1021</b>	Neutral cleaner for spray application, salt free	Fe, Mg, (Al, Cu, Brass) <sup>1</sup>	Residue formation very low, salt-free. E. g.: can be used before heat treatment	Temporary, '2% / 10 °dH	10.2 ± 0.3	1 - 5	65 (30 - 80)	~ 20	1040 ± 10
<b>RENOCLEAN C 20 K 1427</b>	Neutral cleaner for spray application, salt free	Fe, (Mg) <sup>1</sup>	Very good corrosion protection, low residue formation, salt-free. VW approval A29 2863. E. g.: can be used before heat treatment	Temporary, '1.5% / 10 °dH	10.2 ± 0.3	1 - 5	65 (40 - 80)	~ 15	1044 ± 10

# Cleaner

Product name	Function	Materials	Comments	Corrosion protection, chip/filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>1-Component Products</b>									
<b>RENOCLEAN VR 2950</b>	Spray cleaner for ferrous metals	Fe, cast iron, stainless steel	Contains amines, borates. Spray cleaner for bathtubs before enamelling	Temporary, '2% / 10 °dH	9.6 ± 0.4 in 10 ° DIN water	1 - 4	60 (30 - 80)	~ 20	1055 ± 10
<b>RENOCLEAN MTA 3003</b>	Spray cleaner, suitable for immersion and ultrasonic cleaning	Fe, Al, (Zn, Cu, Brass) <sup>1</sup>	Silicate-free, contains hydroxides, phosphates and amines. Universally applicable, e. g. for engine reconditioning	Temporary, '3% / 10 °dH	9.7 ± 0.3 (3%)	2 - 7	65 (40 - 80)	~ 15	1120 ± 10
<b>RENOCLEAN MSA 3001</b>	Spray cleaner, suitable for immersion and ultrasonic cleaning	Fe, Al, Brass, Cu, Zn	Silicate-free, contains hydroxides, phosphates and amines. Universally applicable, RC MTA 3003 precursor	Temporary, '2.5% / 10 °dH	9.7 ± 0.3 (3%)	2 - 7	60 (40 - 80)	~ 15	1070 ± 10
<b>RENOCLEAN VR 3356</b>	Spray and high-pressure cleaners, disposable in coolants	Fe, Plastics, (Al) <sup>1</sup>	Contains borates and amines. Foam-free from approx. 40 °C, depending on pressure and temperature	Temporary, '2 % / 10 °dH	9.8 ± 0.4	2 - 7	60 (40 - 80)	~ 300	1070 ± 10
<b>RENOCLEAN VR 1798/2</b>	Cleaner for immersion, ultrasonic and manual use	Fe, (Al, Cu, Brass) <sup>1</sup>	Contains phosphates, amines and silicates. Suitable for floor and manual cleaning from 20°C.	(Temporary) '9% / 10 °dH	10.8 ± 0.5	2 - 7	65 (20 - 80)	–	1050 ± 10
<b>RENOCLEAN WSA 4002</b>	Cleaner for spraying, immersion, ultrasonic and manual application	Fe, Al, (Mg) <sup>1</sup>	Contains hydroxides, amines and silicates. For heavily soiled parts and aggregates (e. g. railways, engine and chassis parts)	Temporary, '2.5% / 20 °dH	12.1 ± 0.4 at 2.5%	2 - 7	60 (30 - 70)	15	1085 ± 10
<b>RENOCLEAN FDC 4001</b>	Cleaner for immersion, ultrasonic and manual use	Fe, Mg, Titan, Plastics <sup>1</sup>	Contains phosphates, hydroxides. For cleaning tasks in medical technology, supports spot-free drying. Can be combined with RENOCLEAN MDT 3002.	–	12.1 ± 0.4	2 - 7	65 (50 - 80)	–	1090 ± 10
<b>RENOCLEAN MDA 4002</b>	Immersion and ultrasonic cleaner, sprayable	Fe, Fe galv., Mg, (Al) <sup>1</sup>	Silicate free, contains hydroxides and phosphates. For cleaning of parts, e. g. with difficult to remove forming lubricants.	Temporary, '2.5 % / 20 °dH	12.2 ± 0.3	1 - 7	65 (40 - 80)	8	1145 ± 10
<b>RENOCLEAN FSA 4017</b>	Spray cleaner, suitable for immersion and ultrasonic cleaning	Fe, (Mg) <sup>1</sup>	Silicate-free, contains hydroxides, amines and phosphates. For cleaning of parts, e. g. with difficult to remove pigment dirt.	Temporary, '2 % / 20 °dH	12.3 ± 0.5	1 - 7	65 (35 - 85)	25	1168 ± 10
<b>RENOCLEAN VR 2999</b>	Spray and immersion cleaner, suitable for ultrasonic cleaning	Fe, cast iron, stainless steel	Contains hydroxide and phosphate. For cleaning of parts, e. g. with difficult to remove pigment dirt.	Temporary, '2% / 10 dH	12.4 ± 0.6	2 - 7	60 (40 - 80)	~ 10	1175 ± 10



# RENOCLEAN

Product name	Function	Materials	Comments	Corrosion protection, chip/filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Acid Cleaner</b>									
<b>RENOCLEAN FSO 2010</b>	Neutral deruster for spraying, immersion and ultrasonic applications	Fe, (Al)	Chloride-free, applicable after thermal or electro-chemical deburring. Parts are metallicity blank after treatment and therefore to be provided immediately with corrosion protection (RENOCLEAN or ANTICORIT products).	–	5.9 ± 0.5 at 5%	2 - 30	50 (20 - 75)	20	1265 ± 20
<b>RENOCLEAN FTM 1001</b>	Rust removal, descaling, phosphoric acid containing, for immersion, ultrasonic and manual application	Fe	Suitable for cleaning calcified and germ-infested cleaning systems. Integrated consumption indicator. Parts are metallicity blank after treatment and therefore to be provided immediately with corrosion protection (RENOCLEAN or ANTICORIT products).	–	1.5 ± 0.5 in DI water	5 - 50	30 (20 - 60)	5	1360 ± 10

## Cleaner

Product name	Function	Materials	Comments	Corrosion protection, chip/ filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Special Products</b>									
<b>RENOCLEAN SPEZIAL 2000</b>	Emulsifying universal cleaner for immersion, ultrasonic and manual cleaning of commercial vehicles, tarpaulins, halls and workshops.	All materials <sup>1</sup>	Contains phosphates Specs • FORD 800 51 007. Suitable for all manual cleaning, for immersion, steam jet and floor cleaning equipment	–	10.9 ± 0.4 at 3%	2 - 20	35 (20 - 80)	–	1045 ± 10
<b>RENOCLEAN GXA 3004</b>	Floor, system and hall cleaner	All materials <sup>1</sup>	Odour neutral. For all manual and mechanical applications, especially suitable for floor cleaning devices	–	9.1 ± 0.5 (100%)	1 - 20	20 (20 - 40)	–	1047 ± 10
<b>RENOCLEAN GXA 4014</b>	Universal cleaner for floors, halls and vehicles	All materials <sup>1</sup>	Lime scent. For the mechanical and manual cleaning of workshop, vehicle fleet, etc.	–	11.7 ± 0.5 (1%)	1 - 20	20 (20 - 80)	–	1036 ± 10
<b>RENOCLEAN GSO 3001</b>	Cleaner for transport containers (KLT) for spraying and manual application	All materials <sup>1</sup>	For removing oil, grease, abrasion and transport dust. Designed for container cleaning systems	–	8.5 ± 0.5 (100%)	1 - 10	60 (20 - 80)	5	1004 ± 10
<b>RENOCLEAN GTM 3001</b>	Drying accelerator for spraying and immersion application	Plastics, (metals) <sup>1</sup>	Antistatic effect on plastic surfaces. Dosage in rinse tank e. g. for faster drying of plastic containers	–	8.7 ± 1	0.2 - 1.0	50 (20 - 80)	5	1017 ± 10
<b>RENOCLEAN AKTIV DA</b>	Demulsifier for the separation of emulsified oil	–	Demulsifier with defoaming action. Devices to remove the demulsified oil are necessary (oil separator etc.)	–	9.3 ± 0.5 (100%)	0.05 - 1.0	10 - 90	–	988 ± 10
<b>RENOCLEAN GXM 3001</b>	Defoamer, foam regulating additive especially for cleaning solutions	–	Based on paintable polysiloxanes. Immediate, long-lasting defoaming and de-aerating effect	–	7.4 ± 1 (100%)	0.01 - 0.25	10 - 90	–	998 ± 10
<b>ENTSCHÄUMER W</b>	Defoamer based on silicone oil, foam regulating additive for general use	–	Silicone oil based. May cause interference with subsequent coating	–	7.4 ± 1 (100%)	0.05 - 0.5	–	–	998 ± 10

# RENOCLEAN

Product name	Function	Materials	Comments	Corrosion protection, chip/filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Special Products</b>									
<b>RENOCLEAN 431</b>	Industrial assembly aid for rubber and elastomers	–	Lubricant, e. g. for fitting window seals made of rubber, hoses etc. Parts are fixed after drying, no more sliding effect	–	7 ± 1 (100%)	10 - 30	15 - 30	–	1017 ± 10
<b>RENOCLEAN MXO 3001</b>	Vibratory grinding compound with synth. Corrosion protection, mild alkaline cleaner for immersion application	Fe, (Mg, Al, Cu, Brass) <sup>1</sup>	Suitable for all ferrous metals, after testing also for aluminium, zinc and magnesium materials	Temporary, '5% / in DI water	8.8 ± 0.5 (5 %)	2 - 5	20 - 80	–	1029 ± 10
<b>RENOCLEAN FXM 3014</b>	Ready-to-use synthetic welding release agent in finished application concentration	Fe	Forms a continuous moist film that prevents the adhesion of welding beads.	–	8.7 ± 0.5 (100%)	100	Room temperature	–	1032 ± 10

# Cleaner

Product name	Function	Materials	Comments	Corrosion protection, chip/ filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Builder Components</b>									
<b>RENOCLEAN MTA 2001</b>	Builder, neutral, for immersion, pressure flood, flood and spray application	Al, Cu, Brass, (Zn) <sup>1</sup> , Plastics	Free of borate, silicate and surfactants, phosphate-containing, micro-filterable. *	–	7.8 ± 0.8	2 - 7	65 (20 - 80)	Applicable spraying pressure according to the surfactant component used!	1335 ± 20
<b>RENOCLEAN MTA 4001</b>	Builder, medium alkaline, for immersion, pressure flood, flood and spray application	Fe, (Mg, Al, Cu, Brass, Zn) <sup>1</sup> , Plastics	Free of borate, silicate and surfactants, phosphate-containing, micro-filterable. *	–	10.0 ± 0.5	2 - 7	65 (20 - 80)		1568 ± 20
<b>RENOCLEAN FTA 4002</b>	Builder, highly alkaline, for immersion, pressure flood, flood and spray application	Fe, Mg, Plastics <sup>1</sup>	Free of borate, silicate and surfactants, containing hydroxide and phosphate, micro-filterable. *	–	12.5 ± 0.5	2 - 8	65 (20 - 80)		1435 ± 20
<b>RENOCLEAN ENTFETTER 39</b>	Builder, highly alkaline, contains silicate, for immersion, pressure flood, flood and spray application	Fe, Mg, Al, (Cu, Brass, Zn) <sup>1</sup> , Plastics <sup>1</sup>	Borate-free, contains hydroxides, phosphates and silicates. *	–	12.6 ± 0.6	1 - 20	65 (20 - 80)		1370 ± 10
<b>RENOCLEAN FTA 4001</b>	Builder, highly alkaline, for immersion, pressure flood, ultrasonic and spray cleaning, electrolytic degreasing, dephosphating	Fe, Mg, (Cu, Brass) <sup>1</sup> , Plastics <sup>1</sup>	Borate-free, contains hydroxides, microfilterable. *	–	12.9 ± 0.6 (1 %)	2 - 18	65 (20 - 80)		1433 ± 20
<b>RENOCLEAN VR 3222</b>	Builder with corrosion protection, recyclable, salt-free, for immersion, pressure flood, flood and spray application	All materials	Free of nitrite, borate, silicate and surfactants, amine-containing, micro-filterable, suitable for high pressure applications. *	Temporary, '3.5% / 10 °dH	8.0 ± 0.4 (3.5%)	2 - 5	60 (20 - 80)		1079 ± 10
<b>RENOCLEAN VR 2729 K</b>	Builder with corrosion protection, recyclable, salt-free, for immersion, pressure flood, flood and spray application	Fe, Mg, (Zn) <sup>1</sup> , Plastics	Nitrite, borate, silicate and surfactant-free, amine-containing, microfilterable. Protects against corrosion in the vapour phase. *	Temporary, '2 % / DI water	10.8 ± 0.5 (3 %)	2 - 5	60 (20 - 80)		1035 ± 10

Fe – steel, iron, cast iron and stainless steel

1 – to check first

\* – Observe product information - use with appropriate surfactant components

# RENOCLEAN

Product name	Function	Materials	Comments	Corrosion protection, chip/filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Surfactant Components</b>									
<b>RENOCLEAN MST 2001</b>	Cleaning booster for immersion, pressure flooding, ultrasonic and spray cleaning	All materials, Plastics <sup>1</sup>	Micro-filterable, strongly dependent on membrane and operating parameters! *	–	6.0 ± 1	0.3 - 3	65 (40 - 80) Spraying min. 50	5 (7,5 bei > 65)	1027 ± 10
<b>RENOCLEAN MTT 2003</b>	Cleaning booster for immersion, pressure flooding, ultrasonic and spray cleaning	All materials, Plastics <sup>1</sup>	Micro-filterable, strongly dependent on membrane and operating parameters! *	–	7.9 ± 1	0.3 - 3	60 (20 - 80) Spraying min. 40	15 (25 bei >60)	1024 ± 20
<b>RENOCLEAN TENSID 161</b>	Cleaning booster for immersion, ultrasonic and pressure flood cleaning	All materials, Plastics <sup>1</sup>	Micro-filterable, strongly dependent on membrane and operating parameters! *	–	8.6 ± 0.5	0.1 - 1	65 (40 - 80)	2 (>60)	1025 ± 10
<b>RENOCLEAN VR 1500</b>	Cleaning booster for spray cleaning, neutral cleaner	All materials, Plastics <sup>1</sup>	As a neutral cleaner free of corrosion protection components. *	–	8.5 ± 0.5	0.3 - 4	65 (30 - 80)	25	1047 ± 10
<b>RENOCLEAN MDT 3002</b>	Cleaning booster, emulsifying, for immersion, ultrasonic and pressure flood cleaning	All materials, Plastics <sup>1</sup>	Good ultrasonic support, high oil and fat absorption. *	–	9.8 ± 0.8 (3 %)	0.3 - 2	65 (20 - 80)	–	1050 ± 10

Fe – steel, iron, cast iron and stainless steel

1 – to check first

\* – Compliance with Regulation (EC) No 648/2004 on detergents



## Cleaner

Product name	Function	Comments	Corrosion protection, chip/filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Density at 15 °C in kg/m <sup>3</sup>
<b>System Cleaner</b>						
<b>GROTANOL FF 1 N</b>	System cleaner for coolant supply systems, registered in most European countries!	Contact time 6 - 24h	–	app. 9 at 1%	1 - 3	~ 1012
<b>RENOCLEAN SMC / SMC+</b>	System Cleaner Complete Products for Coolant Supply Systems, SMC+ does not contain any formaldehyde separators	Contact time 8 - 24h	–	9.8 ± 0.3 / 10.4 ± 0.3	1 - 2	1028 ± 10 / 1016 ± 10
<b>RENOCLEAN FXM 4005</b>	System cleaner free of biocides and fungicides, for coolant supply systems, basic system without biocide / fungicide	Contact time 8 - 24h	–	10.0 ± 0.5	1 - 2	1005 ± 10
<b>ACTICIDE OX / MBS / WB 200</b>	Biocides and fungicides for system cleaning, in combination with RENOCLEAN FXM 4005 for targeted dosage.	See Service Program Product Management 1 "Preservatives"	–	–	–	–

# RENOCLEAN

Product name	Function	Flash point	Boiling range	Density at 15 °C in kg/m <sup>3</sup>	Materials	Comments
<b>Solvents</b>						
<b>RENOCLEAN MTS 7001</b>	Cleaning agent based on modified alcohols	≥ 61 °C	165 - 175 °C	880 ± 10 kg/m <sup>3</sup>	All materials, plastics <sup>1</sup>	Distillable and recyclable. Specially designed for closed cleaning systems!
<b>RENOCLEAN MVS 8015</b>	Hydrocarbon cleaner based on isoparaffin, aromatic-free	≥ 56 °C	179 - 197 °C	760 ± 5 kg/m <sup>3</sup>		Distillable and recyclable. Specially designed for closed cleaning systems!
<b>RENOCLEAN MVS 8016</b>	Hydrocarbon cleaner based on isoparaffin, aromatic-free	≥ 62 °C	184 - 206 °C	763 ± 10 kg/m <sup>3</sup>		Narrow boiling range, fast drying, distillable, recyclable. Specially designed for closed cleaning systems!
<b>RENOCLEAN MVS 9014</b>	Hydrocarbon cleaner with corrosion protection, VOC- and aromatic-free	91 ± 5 °C	217 - 255 °C	820 ± 20 kg/m <sup>3</sup>		Universal application, good corrosion protection due to very thin oil film, VOC-compliant. Good corrosion protection properties, for solvent cleaning systems without distillation.
<b>RENOCLEAN KLV</b>	Hydrocarbon cleaner, VOC- and aromatic-free	≥ 90 °C	217 - 255 °C	810 ± 15 kg/m <sup>3</sup>		VOC-compliant, universal application, slow evaporation. VW approval A29 2819. Simple application, e. g. for removal of car wax preservation.
<b>FUCHS MULTICLEAN</b>	Hydrocarbon cleaner, low aromatic, environmentally friendly, demulsifying	≥ 61 °C	180 - 330 °C	795 ± 10 kg/m <sup>3</sup>		Free of caustic and corrosive substances. Universal application in industry and commerce, can be applied with steam jet, good corrosion protection properties.
<b>RENOCLEAN KU</b>	Hydrocarbon cleaner based on isoparaffin, aromatic-free	≥ 61 °C	180 - 220 °C	762 ± 10 kg/m <sup>3</sup>		Gentle cleaning, for precision mechanics and cleaning of electronic parts, not irritating to the skin. Simple application, for solvent systems without permanent distillation.
<b>RENOCLEAN E</b>	Hydrocarbon cleaner emulsifying, especially low-temperature stable	≥ 63 °C	180 - 330 °C	800 ± 10 kg/m <sup>3</sup>		For the cleaning of engines, transmissions, chassis, as well as other aggregates and components. Easy application, also available as aerosol in spray can.
<b>RENOCLEAN KAF</b>	Hydrocarbon cleaner, aromatic-free	≥ 61 °C	160 - 245 °C	790 ± 25 kg/m <sup>3</sup>		Fine cleaning, fast drying. Simple application, suitable for solvent systems (without permanent distillation!)
<b>RENOCLEAN MVS 9005</b>	Wash oil for air cleaning systems	≥ 220 °C	–	840 ± 10 kg/m <sup>3</sup>	Washing oil for air cleaning systems in aluminium rolling mills, distillable, recyclable. Formerly PENTOWASH 30.	

## Cleaner

Product name	Function	Materials	Comments	Corrosion protection, chip/ filter test 0/0 at x% in _	pH (2%), if applicable	Concentration range in %	Temperature range	Injection pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Corrosion Protection</b>									
<b>RENOCLEAN VR 3222</b>	Temporary, mineral-oil-free corrosion protection for immersion, pressure flooding, flood and spray applications	All materials <sup>1</sup>	Nitrite- and borate-free, suitable for vibratory finishing. Water-miscible	Temporary, '3.5 % / 10 °dH	8.0 ± 0.4 (3.5%)	0.5 - 3	60 (20 - 80)	0.1 - ~100	1079 ± 10
<b>ANTICORIT SKR 3001</b>	Temporary, mineral-oil-free corrosion protection for immersion, pressure flooding, flood and spray applications	Fe, Mg, Al, Zn, (Cu, Brass) <sup>1</sup>	Nitrite-free, protects against corrosion in the vapour phase, suitable for vibratory finishing	Temporary, '2 % / 20 °dH	9.8 ± 0.3	0.5 - 5	60 (20 - 80)	0.1 - 3	1033 ± 10
<b>RENOCLEAN VR 2729 K</b>	Temporary, mineral-oil-free corrosion protection for immersion, pressure flooding, flood and spray applications	Fe	Nitrite-free, protects against corrosion in the vapour phase, suitable for vibratory finishing. Water-miscible	Temporary, '2 % / VE	10.8 ± 0.5 bei 3%	0.5 - 5	60 (20 - 80)	0.1 - ~300	1035 ± 10
<b>ANTICORIT MKR 30</b>	Emulsion cleaner, mineral oil containing corrosion protection emulsion for immersion and flood application	Fe, Al, Cu, Brass	Spray application only possible to a very limited extent, boron and monoethanolamine free. Water-miscible	Good, '3 % / 20 °dH	8.8 ± 0.4	3 - 5	50 (20 - 60)	2	986 ± 15
<b>RENOCLEAN 1895</b>	Cooling, pressing off and corrosion protection liquid for immersion and filling applications	Fe	Boron, amine and fragrance containing, VW approval A29 0481	Temporary, '3 % / 10 °dH	9.6 ± 0.3 (3%)	2 - 8	Application-specific	15	1140 ± 10
<b>ANTICORIT SKR 40</b>	Synth. Pressing water and corrosion protection concentrate for immersion and filling applications	Fe	Especially for pressing water applications, drinking water release is cancelled! Water-miscible	Temporary, '4 % / 20 °dH	9.4 ± 0.3 (10%)	3 - 10	20 (10 - 40)	10	1038 ± 10
<b>ANTICORIT SKR 42</b>	Synthetic hydraulic test and corrosion protection concentrate for immersion and filling applications	Fe	Stable against salt and alkali infiltration. Water-miscible	Temporary, '1.5 % / 20 °dH	10 ± 0.5 (10%)	1 - 5	20 (10 - 50)	10	1068 ± 10

## RENOCLEAN, ANTICORIT

Product name	Function	Application	Comments	Available packaging units	Accessories
<b>Skin Protection Prior to Work</b>					
<b>RENOCLEAN HAND PROTECT MULTI</b>	Silicone-free, fingerprint-free, breathable and universally applicable skin protection cream	Before working with alternating substances (water-soluble and water-insoluble contaminants and irritants)	Forms a thin, invisible and protective film on the skin. Active support of cleaning after work	50 * 100 ml tube 6 * 1000 ml pouch bottle	RENOCLEAN DONA 2000K Dispenser (for pouch bottle)
<b>RENOCLEAN HAND PROTECT PRO</b>	Silicone-free, water-soluble skin protection cream	Before working with heavy non-water miscible contaminants such as oils, greases, lubricants, metal abrasion, dust and soot.	Forms a non-slip, thin and protective microfilm on the skin. Contains special surfactants that are well tolerated by the skin and actively support the subsequent cleansing of the skin.	50 * 100 ml tube 6 * 1000 ml pouch bottle	
<b>Skin Cleansing</b>					
<b>RENOCLEAN HAND WASH MILD</b>	Mild, soap-free, unscented skin cleansing gel	For the cleansing of highly stressed and sensitive skin	Especially suitable where frequent hand washing is necessary. Free of perfume, dyes and preservatives	25 * 250 ml bottle 6 * 2000 ml pouch bottle	RENOCLEAN DONA 2000K Dispenser (for pouch bottle)
<b>RENOCLEAN HAND WASH INTENSIVE</b>	Hand cleaner with abrasive particles for heaviest soiling	Excellent for cleaning very dirty hands in repair workshops, mechanical engineering etc.	Contains plastic powder as scrubbing agent, slightly perfumed. Is pH-neutral and contains skin caring substances.	25 * 250 ml bottle 6 * 2000 ml pouch bottle	
<b>Skin Care</b>					
<b>RENOCLEAN HAND CARE</b>	Silicone-free skin care cream	After work, it is ideal as a care cream for hands whose natural protective barrier is damaged during work	Contains caring vegetable oils, beeswax and moisture regulating substances. Keeps the skin healthy and strong when used regularly	50 * 100 ml tube 6 * 1000 ml pouch bottle	RENOCLEAN DONA 2000K Dispenser (for pouch bottle)

# CORROSION PROTECTION

Unprotected, bare metal surfaces lose their elaborated finish quality often due to corrosion, in particular oxidation. This is not only a deterioration of the look-and-feel, but often a loss of proper function.

The ANTICORIT products from FUCHS are temporary corrosion preventives that can be easily removed if necessary without damaging the surfaces to be protected.

ANTICORIT corrosion preventives have been developed under careful consideration of all conditions, both in the laboratory and in practice. They are simple and economical to use and, adapted to the diverse requirements of the practice, are available in a comprehensive product range.

# FORMING LUBRICANTS

The right forming lubricants ensure optimum forming performance, excellent surface texture and process reliability. Their performance and suitability is also influenced by the compatibility with process-substances from upstream and downstream processes. A smooth function of the entire process chain only ensures optimal operating results. Well-matched lubricants make an important contribution here.

With the RENOFORM metalforming solutions from FUCHS, the world's largest independent lubricant manufacturer, you will get the know-how and experience in application consulting as well as tailor-made solutions.





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## Corrosion Protection

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Corrosion Protection Oils</b>											
<b>ANTICORIT RPO 1001</b>	Conventional corrosion protection oil with low viscosity	8	839	2	2	2-4	4-8	146	–	–	–
<b>ANTICORIT RPO 2001</b>	Conventional corrosion protection oil with medium viscosity	15	839	3	4	2-4	4-8	194	–	–	–
<b>ANTICORIT RPO 2002</b>	Conventional corrosion protection oil with medium viscosity; improved corrosion protection	15	846	3	4	3-5	5-8	190	–	–	–
<b>ANTICORIT RPO 3001</b>	Conventional corrosion protection oil with high viscosity	30	847	7	9	3-6	6-9	190	–	–	–
<b>ANTICORIT RPO 3002</b>	Conventional corrosion protection oil with high viscosity; improved corrosion protection	30	851	8	9	3-6	6-8	226	–	–	–
<b>ANTICORIT RPO 3003</b>	Conventional corrosion protection oil with high viscosity	30	871	8	9	3-5	5-8	226	–	–	–
<b>ANTICORIT RPO BGI 15</b>	Corrosion protection oil with VCI; medium viscosity	14	865	4	5	3-6	9-15	155	–	•	•
<b>ANTICORIT RPO BGI 21</b>	Corrosion protection oil with VCI	20,5	902	5	6	3-6	9-15	150	–	•	•
<b>ANTICORIT KL 7</b>	Corrosion protection oil; medium viscosity	14	885	3	3	2-4	4-8	136	–	–	–
<b>ANTICORIT LBO 160 TT</b>	Corrosion protection oil with very high viscosity, suitable for use in low temperature situations	160	920	30	35	3-6	6-9	150	–	–	•
<b>ANTICORIT RPS 30 N</b>	Corrosion protection oil with good environmental and work safety properties, designed for mill application	23	840	8	9	3-6	6-9	230	–	–	–
<b>ANTICORIT RP 30 NT</b>	Corrosion protection oil designed for steel mill application	30	889	8	9	3-6	6-9	172	–	–	–
<b>ANTICORIT RPS 28</b>	Corrosion protection oil designed for steel mill application	24	880	8	9	3-6	6-9	180	–	–	–
<b>ANTICORIT RP 4107 A</b>	Mid-viscous, non thixotropic modification of ANTICORIT RP 4107 S	15	870	8	9	3-6	6-9	130	–	–	–
<b>ANTICORIT RP 4107 LV NT</b>	Low-viscous, non thixotropic modification of ANTICORIT RP 4107 S	12	864	5	6	3-6	6-9	150	–	–	–

# ANTICORIT

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Corrosion Protection Oils</b>											
<b>ANTICORIT PL 3802 39 LV 8</b>	Low-viscous blank washing oil with advanced lubrication, non thixotropic	8	890	2	2	3-6	6-9	110	–	–	•
<b>ANTICORIT PL 3802 39 NT</b>	Non thixotropic modification of ANTICORIT PL 3802 39 S	26	880	7	8	3-6	6-9	n/a	–	–	•
<b>ANTICORIT PL 39 LV 8</b>	Low-viscous blank washing oil	8	880	2	2	3-6	6-9	116	–	–	•
<b>ANTICORIT PL 39 LV 18</b>	Mid-viscous blank washing oil	17	900	6	7	3-6	6-9	158	–	–	•
<b>Oily Corrosion Preventative Concentrates</b>											
<b>ANTICORIT RPC 5000</b>	Corrosion protection concentrate, successor of ANTICORIT OHK	85	887	Depends on conc.	Depends on conc.	Depends on conc.	Depends on conc.	248	–	–	–
<b>ANTICORIT RPC 5002</b>	Corrosion protection concentrate, low-viscous	45	863					160	–	–	–
<b>ANTICORIT MPC 5000</b>	Corrosion protection concentrate, advanced corrosion protection and lubrication performance	90	890					240	–	–	–
<b>ANTICORIT 03 W C</b>	High-viscous, thixotropic corrosion protection concentrate	160	912					150	•	–	–

## Corrosion Protection

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Thixotropic Corrosion Protection Oils</b>											
<b>ANTICORIT BGO 15 X</b>	Thixotropic corrosion protection oil with very good corrosion protection and lubrication properties	14	860	4	5	12-24	12-36	130	•	–	–
<b>ANTICORIT LBO 18 X</b>	Thixotropic corrosion protection oil and lubrication properties	15	860	4	5	12-18	12-24	130	•	–	–
<b>ANTICORIT TX 11</b>	Thixotropic corrosion protection oil with lubrication properties	40	883	26	30 at 60 °C	6-12	12-24	160	•	–	–
<b>ANTICORIT TW 16</b>	High-viscous corrosion protection oil for hot application	32 at 50 °C	883	10	11 at 85 °C	6-12	12-24	170	•	–	–
<b>ANTICORIT LSB</b>	Thixotropic corrosion protection oil	140	907	9	10 at 70 °C	4-8	8-16	196	•	–	–
<b>ANTICORIT BGI 14 X</b>	Thixotropic corrosion protection oil with VCI	30 at 20 °C	860	5	4	12-24	12-36	130	•	•	–
<b>ANTICORIT RP 4107 S</b>	Thixotropic corrosion protection oil for still mill application on body-in-white strips, meets VDA 230-213	35	887	10	11	6-12	12-20	210	•	–	–
<b>ANTICORIT RP 4107 LV</b>	Low-viscous modification of ANTICORIT RP 4107 S, meets VDA 230-213	12	865	2	2	4-8	8-16	150	•	–	–
<b>ANTICORIT PL 3802 39 S</b>	First generation thixotropic prelude, meets VDA 230-213	60	910	10	11	6-12	12-20	180	•	–	•
<b>ANTICORIT PLS 100 T</b>	Second generation thixotropic prelude, meets VDA 230-213	100	910	10	11	6-12	12-20	180	•	–	–
<b>ANTICORIT PL 3802 39 LV</b>	Low-viscous modification of ANTICORIT PL 3802 39 S, suitable as blank washing oil, meets VDA 230-213	15	891	5	6	4-8	8-16	150	•	–	–
<b>ANTICORIT PL 39 SX</b>	Hotmelt for mill application, meets VDA 230-213	20 at 60 °C	895	–	–	6-12	12-20	175	•	–	•
<b>ANTICORIT LBX 5000</b>	High-viscous corrosion protection oil with good lubrication performance	10 at 100 °C	810	6	8 at 120 °C	6-12	12-24	240	•	–	•

# ANTICORIT

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Mineral Oil-free Corrosion Protection Products</b>											
<b>ANTICORIT EB 1</b>	Ester based corrosion protection oil for mill application, suitable for embalage sheets	17	951	–	0,3	–	1-3	175	–	–	•
<b>ANTICORIT BML 3</b>	Corrosion protection based on polyglycol, suitable for brake components	35	985	–	–	1-3	3-6	200	–	–	–
<b>ANTICORIT SYNTH</b>	Fully synthetic multipurpose oil, good lubrication properties	102	834	–	–	3-6	6-12	150	–	–	•
<b>Solvent based Corrosion Protection Products</b>											
<b>ANTICORIT RPS 6201</b>	Solvent based corrosion protection oil, 20% evaporation residue, D40 solvent	2.2 at 20 °C	800	100	2	6-9	12-18	>40	–	–	–
<b>ANTICORIT RPS 7201</b>	Solvent based corrosion protection oil, 20% evaporation residue, D60 solvent	3.3 at 20 °C	810	100	2	6-9	12-18	>60	–	–	–
<b>ANTICORIT RPS 7601</b>	Solvent based corrosion protection oil, 60% evaporation residue, D60 solvent	16.5 at 20 °C	840	100	5	9-12	18-24	>60	–	–	–
<b>ANTICORIT 04 W 2</b>	Pre-diluted corrosion protection oil, 75% evaporation residue, isoparaffin	32 at 20 °C	906	Depends on conc.	Depends on conc.	6-12	12-20	>60	–	–	–
<b>ANTICORIT 04 W 2 VOC kon.</b>	Pre-diluted corrosion protection oil, 75% evaporation residue, VOC free according to 31. BlmSchV	47 at 20 °C	920	Depends on conc.	Depends on conc.	6-12	12-20	>90	–	–	–



## Corrosion Protection

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Water Displacing Corrosion Protection Products</b>											
<b>ANTICORIT DFO 6101</b>	Dewatering fluid, leaving a thin, oily protection layer	1.8 at 20 °C	795	100	0.8	3-6	6-12	>40	–	–	–
<b>ANTICORIT DFO 6301</b>	Dewatering fluid, leaving a thick, oily protection layer	2.6 at 20 °C	821	100	2	6-12	12-24	>40	–	–	–
<b>ANTICORIT DFO 7101</b>	Dewatering fluid, leaving a thin, oily protection layer	2.8 at 20 °C	810	100	1	3-6	6-12	>60	–	–	–
<b>ANTICORIT DFO 7301</b>	Dewatering fluid, leaving a thick, oily protection layer	4.6 at 20 °C	825	100	2.5	6-12	12-24	>60	–	–	–
<b>ANTICORIT DFO 8101</b>	Dewatering fluid, leaving a thin, oily protection layer	2.4 at 20 °C	780	100	1	3-6	6-12	>60	–	–	–
<b>ANTICORIT DFO 8301</b>	Dewatering fluid, leaving a thick, oily protection layer	4 at 20 °C	800	100	2.5	6-12	12-24	>60	–	–	–
<b>ANTICORIT DFO 9101</b>	Dewatering fluid, leaving a thin, oily protection layer, VOC free acc. to 31. BlmSchV	4.4 at 20 °C	820	100	1	3-6	6-12	>90	–	–	–
<b>ANTICORIT DFO 9301</b>	Dewatering fluid, leaving a thick, oily protection layer, VOC free acc. to 31. BlmSchV	7.2 at 20 °C	835	100	2.5	6-12	12-24	>90	–	–	–
<b>ANTICORIT DFW 6101</b>	Dewatering fluid, leaving a thin, waxy protection layer	1.6 at 20 °C	795	100	1	3-6	6-12	>40	•	–	–
<b>ANTICORIT DFW 6301</b>	Dewatering fluid, leaving a thick, soft waxy protection layer	3.7 at 20 °C	813	100	2	6-12	12-24	>40	•	–	–
<b>ANTICORIT DFW 7101</b>	Dewatering fluid, leaving a thin, waxy protection layer	2.7 at 20 °C	800	100	1	3-6	6-12	>60	•	–	–
<b>ANTICORIT DFW 7301</b>	Dewatering fluid, leaving a thick, soft waxy protection layer	4.3 at 20 °C	820	100	2.5	6-12	12-24	>60	•	–	–
<b>ANTICORIT DFW 8101</b>	Dewatering fluid, leaving a thin, waxy protection layer	3.5 at 20 °C	780	100	1	3-6	6-12	>60	•	–	–
<b>ANTICORIT DFW 8301</b>	Dewatering fluid, leaving a thick, soft waxy protection layer	3.7 at 20 °C	800	100	2.5	6-12	12-24	>60	•	–	–
<b>ANTICORIT DFW 9101</b>	Dewatering fluid, leaving a thin, waxy protection layer, VOC free acc. to 31. BlmSchV	4.2 at 20 °C	820	100	1	3-6	6-12	>90	•	–	–

# ANTICORIT

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Water Displacing Corrosion Protection Products</b>											
<b>ANTICORIT DFW 9301</b>	Dewatering fluid, leaving a thick, soft waxy protection layer, VOC free according to 31. BlmSchV	6.7 at 20 °C	835	100	2.5	6-12	12-24	>90	•	–	–
<b>ANTICORIT DFW 9302</b>	Dewatering fluid, leaving a thick, soft waxy protection layer, VOC free according to 31. BlmSchV	7.1 at 20 °C	841	100	2	6-12	12-24	>100	•	–	–
<b>ANTICORIT DFW 9601</b>	Dewatering fluid, leaving a very thick, soft waxy protection layer, VOC free according to 31. BlmSchV	10.4 at 40 °C	855	100	5	9-15	18-24	>100	•	–	–
<b>Water-miscible, Oily Corrosion Protection Products</b>											
<b>ANTICORIT WMC 7000</b>	Emulsifiable corrosion protection oil with medium performance	60 at 40 °C	922	De- pends on conc.	De- pends on conc.	De- pends on conc.	De- pends on conc.	>175	–	–	–
<b>ANTICORIT WMC 9000</b>	Emulsifiable corrosion protection oil with high performance	100 at 40 °C	942					>175	–	–	–
<b>ANTICORIT MKR 10</b>	Emulsifiable corrosion protection oil with high performance and thixotropic characteristics	128 at 40 °C	931					>150	•	–	–
<b>ANTICORIT WOK 50</b>	Emulsifiable corrosion protection oil with high performance, semi stable emulsion	180 at 40 °C	948					>190	–	–	–
<b>Water-miscible, Synthetic Corrosion Protection Products</b>											
<b>ANTICORIT SKR 3001</b>	Mineral oil free (synthetic) corrosion protection concentrate	–	1030	De- pends on conc.	De- pends on conc.	–	<1	–	–	•	–

# Corrosion Protection

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Waxy Corrosion Protection Products</b>											
<b>ANTICORIT BW 10</b>	Solvent containing corrosion protection wax, leaves a transparent touch dry film, contains Barium	FT - 4mm nozzle = 20s	822	30	18	6-24	12-36	>40	•	–	–
<b>ANTICORIT BW 12</b>	Solvent containing corrosion protection wax, leaves a transparent touch dry film	FT - 4mm nozzle = 17s	809	50	8	6-18	12-24	>60	•	–	–
<b>ANTICORIT BW 366</b>	Solvent containing corrosion protection wax, leaves a brownish touch dry film with very high corrosion protection properties	FT - 4mm nozzle = 60s	885	10	50	12-36	12-36	>60	•	–	–
<b>ANTICORIT HKW 350</b>	Solvent containing corrosion protection wax for cavity protection	FT - 4mm nozzle = 27s	950	20	30	12-36	12-36	>60	•	–	–
<b>ANTICORIT CPX 3373</b>	Solvent free corrosion protection wax with very high performance, air curing properties	dyn. visc. at 300 1/min = 350m*Pas	1005	15	75	>36	>36	>135	•	–	–
<b>ANTICORIT CPX 3373 LV</b>	Solvent free corrosion protection wax with very high performance, reduced thixotropic properties, easy to spray, air curing	dyn. visc. at 300 1/min = 170m*Pas	1005	30	30	>24	>24	>220	•	–	–
<b>ANTICORIT CPX 3373 HV</b>	Solvent free corrosion protection wax with very high performance, air curing properties	dyn. visc. 300 1/min = 190m*Pas	1005	15	75	>36	>36	>160	•	–	–
<b>ANTICORIT CPX 3373 UBC</b>	High-viscous modification of ANTICORIT CPX 3373 for under body coating	dyn. visc. at 300 1/min = 500m*Pas	1005	–	–	>36	>36	>130	•	–	–
<b>ANTICORIT WMW 9001</b>	Water-miscible wax dispersion	–	1000	10	50	6-18	12-24	–	•	–	–
<b>ANTICORIT CPW 9001</b>	Water-miscible wax dispersion for automotive outer skin protection	–	1000	10	50	6-18	12-24	–	•	–	–

\*) Value of pure product

## ANTICORIT

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Volatile Corrosion Inhibitor</b>											
<b>ANTICORIT VCI UNI O 40</b>	Corrosion protection of closed systems like tanks and gear boxes. Miscible with diesel, gear oils, and other mineral oils	•	•	•	–	≤6	≤24	>120	–	•	–
<b>ANTICORIT VCI UNI IP 30</b>	Corrosion protection of closed packaging systems like blisters and card board boxes. Suitable for eg power train components and body in white parts	•	•	•	–	≤6	≤24	>60	–	•	–
<b>ANTICORIT VCI FE W 50</b>	Additive to improve corrosion protection properties of water based cleaners,	•	–	–	–	≤6	≤24	–	–	•	–
<b>ANTICORIT VCI UNI W 50</b>	cutting fluids and cooling fluids in closed systems	•	•	•	–	≤6	≤24	–	–	•	–
<b>ANTICORIT VCI UNI S</b>	Corrosion protection for easy application in already existing packaging solutions.	•	•	•	–	≤6	≤24	–	–	•	–
<b>ANTICORIT VCI UNI T</b>	Corrosion protection for easy application in already existing packaging solutions. Suitable for small cavities.	•	•	•	–	≤6	≤24	–	–	•	–
<b>ANTICORIT VCI UNI G</b>	Corrosion protection for easy application in already existing packaging solutions. Contains desiccants.	•	•	•	–	≤6	≤24	–	–	•	–
<b>ANTICORIT VCI UNI FI</b>	VCI film for corrosion protection during shipping and storage (available as gusseted bags, flat films and others).	•	•	•	–	≤6	≤24	–	–	•	–
<b>ANTICORIT VCI UNI P</b>	VCI paper for protection during shipping and storage.	•	•	•	–	≤6	≤24	–	–	•	–
<b>ANTICORIT VCI FE P</b>	VCI paper for protection of steel during shipping and storage.	•	–	–	–	≤6	≤24	–	–	•	–

## Corrosion Protection

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]
<b>Spray Cans</b>							
<b>ANTICORIT 5F</b>	Rust preventative spray forming a thin film with active water displacement	3.7 at 20 °C	813	–	2.5	6-12	12-24
<b>ANTICORIT BW 10</b>	Solvent-based high performance corrosion protection wax	FT 4mm nozzle = 20s	822	–	18	6-24	12-36
<b>ANTICORIT BW 366</b>	Solvent-based and durable high performance corrosion protection wax	FT 4mm nozzle = 60s	885	–	50	12-36	12-36
<b>ANTICORIT DFG</b>	Classic anti-corrosive oil and contact spray, multipurpose	84	887	–	5	6-12	12-24
<b>ANTICORIT RPC</b>	Rust preventative spray, after evaporation a highly viscous film is formed	84	887	–	5	6-12	6-24
<b>ANTICORIT CPX 3373</b>	Solvent-free*) and durable high performance corrosion protection wax	Dyn. visc. at 300 1/min = 350m*Pas	1005	–	50	>36	>36
<b>ANTICORIT SYNTH</b>	Synthetic multipurpose oil	102	834	–	15	3-6	6-12
<b>RENOCLEAN E</b>	Highly effective degreaser for multipurpose use	1.7 at 20 °C	800	–	0	–	–
<b>ANTICORIT RP 4107 S</b>	Thixotropic corrosion protection oil, meets VDA 230-213	35	887	9.757	11	6-12	12-20

\*) Value of pure product



## ANTICORIT, RENOCLEAN

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Consumption [l/m <sup>2</sup> ]	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Lubricating properties
<b>Maintenance Fluids for Dewatering Products</b>											
<b>ANTICORIT DF 6000</b>	Waterdisplacement, leaving no residues, D40 solvent	1.2 at 20 °C	780	–	–	–	–	>40	–	–	–
<b>ANTICORIT DF 7000</b>	Waterdisplacement, leaving no residues, D60 solvent	2.0 at 20 °C	795	–	–	–	–	>60	–	–	–
<b>ANTICORIT DF 8000</b>	Waterdisplacement, leaving no residues, isoparaffin solvent	1.8 at 20 °C	777	–	–	–	–	>60	–	–	–
<b>ANTICORIT DF 9000</b>	Waterdisplacement, leaving no residues, D90 solvent, VOC free according to 31. BImSchV	2.8 at 20 °C	810	–	–	–	–	>90	–	–	–
<b>ANTICORIT DFC 1001</b>	Additive to enhance water displacement properties	6.2 at 20 °C	953 at 20 °C	–	–	–	–	>105	–	–	–

## Forming Lubricants

## RENOFORM



Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [KG/m <sup>3</sup> ]	Copper strip test	Application	Materials	FP [°C]
<b>RENOFORM MZA 08 T</b>	Drawing oil for car body pressing used as spot lubricant	25	878	2	Drawing, deep-drawing	Steel and aluminium	154
<b>RENOFORM MCO 3802 SN</b>	Drawing oil for car body pressing, meets VDA 201-213	100	918	2	Drawing, deep-drawing	Steel and aluminium	142
<b>RENOFORM MCO 3028</b>	Suitable for drawing and deep-drawing of bodywork sheet metal for medium and difficult forming operations, meets VDA 201-213	130	918	4	Drawing, deep-drawing	Cold rolled, galvanised and aluminium surfaces	155
<b>RENOFORM MCO 3028 LV</b>	Mainly free of residues after evaporation, evaporation residue corresponds with RENOFORM MCO 3028	2.5 at 20 °C	775	4	Stamping, forming and easy drawing	Cold rolled, galvanised and aluminium surfaces	260

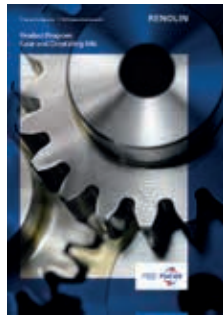
### Non Water-miscible Cold Rolling Oils

<b>RENOFORM WO 52 B</b>	Rolling oil for cold rolling and skin pass	6	850	1	Cold rolling, rerolling, corrosion protection	Iron and non-ferrous metals	>100
<b>RENOFORM WO 79 A</b>	Rolling oil with high EP additivation	9	854	1	Cold rolling with high reductions per pass	Iron and non-ferrous metals	>170

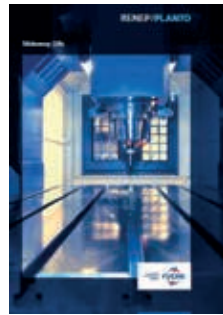
## Industrial Product Brochures



Hydraulic oils – RENOLIN



Gear and general lubricating oils – RENOLIN



Slideway oils – RENEPLANTO



Lubricants for the paper industry



Refrigeration oils – RENISO



Special lubricants for wind power plants



Rapidly biodegradable industrial lubricants – PLANTO



Lubricant solutions for the medical technology



AEROSPACE lubricants



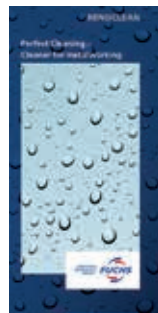
ECOCOOL GLOBAL 10 PLUS – Metal working fluid for aerospace



Water-miscible and Neat Cutting Fluids – ECOCOOL / ECOCUT



ECOCUT FT-Series – Non water-miscible cooling lubricants based on innovative base oils



Cleaner for metalworking – RENOCLEAN



Lubricants in spray cans



# Notes

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The information contained in this brochure is based on the experience and know-how of FUCHS SCHMIERSTOFFE 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 brochure 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 SCHMIERSTOFFE 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 in this brochure at any time and without warning, unless otherwise provided in customer-specific agreements. With the publication of this brochure, all previous editions cease to be valid.

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## 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 employees will be glad to advise on products for the application in question and also on our full range of lubricants.

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