

# Product Program **Industrial Lubricants**

2021

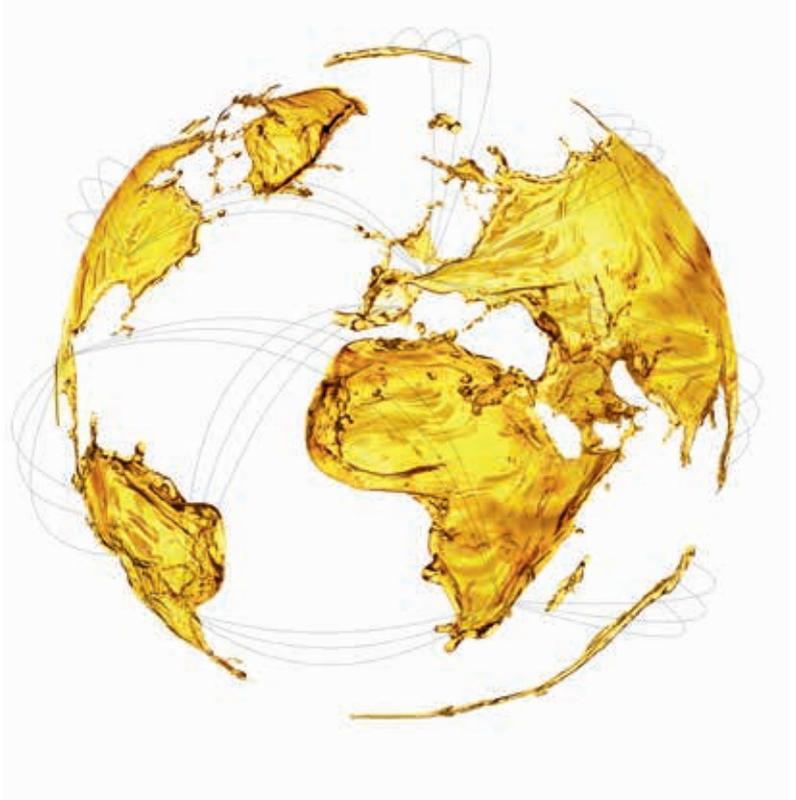


# LUBRICANTS. TECHNOLOGY. PEOPLE.

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:** IATF 16949, ISO 14001, ISO 45001, 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 85 years – for virtually all areas of application and sectors. With over 100,000 customers and 62 companies worldwide, the FUCHS Group is the leading independent supplier of lubricants.

A team of more than 950 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

Within the DMQP Program FUCHS supplies as a certified DMQP partner at DMG MORI cooling lubricants and lubricants that have been exclusively tailored to machines and processes. The DMQP program generates synergies out of machines, peripheries and accessories with the very highest quality standards. It combines innovation and technology expertise from selected DMQP partners, who have been exclusively awarded the premium seal of quality for their products.



### 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 Preventives 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**

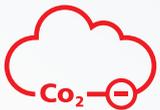
## FUCHS lubricants

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

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



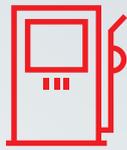
Rapidly biodegradable



Reduced CO<sub>2</sub>



Food grade



Fuel saving



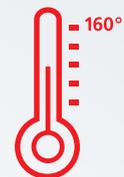
Process compatibility



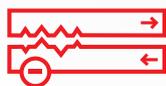
Corrosion protection



Extension of maintenance intervals



High thermal resistance



Less wear



Reduced oil consumption

# Examples for Key Technologies

## RENOLIN XTREMETEMP INDUSTRIAL OILS

RENOLIN XtremeTemp hydraulic oils have a particular position on the market, especially from the point of view of sustainability. Due to their special formulation, they show remarkably high fuel savings potential of 3 to 6% in mobile hydraulics.

## RENOLIN ZAF B HT INDUSTRIAL OILS

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 VCI CLP INDUSTRIAL OILS

The new RENOLIN VCI CLP oils are high performance industrial gear oils that combine the properties of a high performance gear oil with reliable corrosion protection. Thanks to their vapor phase corrosion protection, RENOLIN CLP VCI oils guarantee reliable long-term protection and are used in industrial gear boxes 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-free and fulfils 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.

# 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 19</b>	<b>Range RENOLIN AR</b> General lubricating oils based on mineral oil. Exceeds the requirements of L-AN lubricating oils according to DIN 51501.  AR 19: AN 100 AR 22: AN 150	883	260	100	11.0	94	-15	For lubrication systems without special requirements regarding ageing 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 22</b>		888	240	150	14.6	96	-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>Demulsifying Circulating, Spindle and Hydraulic Oils: HL / CL</b>								
<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 51524-1: HL hydraulic oils and DIN 51517-2: CL circulating oils based on mineral oil, demulsifying (water-separation), zinc-free.	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	
<b>RENOLIN DTA 15</b>	ISO 6743-4: HL, ISO 6743-6 and ISO 12925-1: CKB.	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	

## 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 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 51524-2. 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 HF0, HF1, HF2
<b>RENOLIN B 30</b>		883	232	100	11.1	96	-18	Demulsifying type
<b>RENOLIN B 10 PLUS</b>	<b>Range RENOLIN B 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.	840	170	10	2.7	104	-54	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.
<b>RENOLIN B 15 PLUS</b>		840	195	15	3.5	108	-48	
<b>RENOLIN B 22 PLUS</b>		845	220	22	4.4	108	-45	Demulsifying type
<b>RENOLIN B 32 PLUS</b>		862	220	32	5.5	108	-39	Denison HF0, HF1, HF2 Bosch Rexroth RDE 90245
<b>RENOLIN B 46 PLUS</b>		865	230	46	6.9	107	-36	
<b>RENOLIN B 68 PLUS</b>		867	230	68	9.0	108	-33	
<b>RENOLIN B 100 PLUS</b>	870	270	100	11.6	104	-27		
<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 ageing stability, corrosion protection and wear protection. The products of the RENOLIN B HVI range are HVLP hydraulic and circulating oils according to DIN 51524-3, mineral oil based, demulsifying and zinc-containing AW/EP additives. DIN 51524-3: 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	

# 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 B 15 HVI Plus</b>	<b>Range RENOLIN B HVI Plus</b> Hydraulic and lubricating oils based on highquality hydrated base oils (Group II). High viscosity index and excellent shear stability, in combination with extraordinary oxidation stability, effects in long lifetime. High wear protection by using zinc-containing AW/EP additives, demulsifying.  DIN 51524-3: HVLP ISO 6743-4: HV ISO 11158: HV Denison HF0, HF1, HF2	844	190	15	3.8	148	-57	RENOLIN B HVI Plus oils are suitable for all stationary and mobile hydraulic systems when a high viscosity index and low cold-temperature viscosity is required. Extended oil change interval possible. High pressure applications are possible due to excellent AW/EP additive system.  Denison HF0, HF1, HF2
<b>RENOLIN B 22 HVI Plus</b>		845	210	22	4.9	152	-48	
<b>RENOLIN B 32 HVI Plus</b>		846	230	32	6.3	151	-42	
<b>RENOLIN B 46 HVI Plus</b>		856	240	46	8.2	152	-42	
<b>RENOLIN B 68 HVI Plus</b>		854	260	66,5	10.8	153	-33	
<b>RENOLIN B 100 HVI Plus</b>		837	260	102	14.0	139	-36	
<b>RENOLIN B 150 HVI Plus</b>		876	260	151	18.0	132	-33	
<b>RENOLIN D 7 PLUS</b>	<b>Range RENOLIN D Plus</b> Hydraulic oils with detergent properties and additives based on highquality hydrated base oils (Group II) to improve ageing resistance, corrosion protection and wear protection. Zinc-containing AW/EP additive systems, good viscosity-temperature behaviour. Hydrotreated base oils offer excellent oxidation stability.  DIN 51524-2: HLP-D ISO 6743-4: HM (with DD-properties)	832	176	6,8	2.1	106	-60	RENOLIN D Plus hydraulic oils can be used in hydraulic and circulating systems - excellent oxidation stability enables reliable operation even at high temperatures and thermal stress. DD-properties avoid deposits and sludge, free water is avoided by emulsifying properties, this protects components of corrosion.
<b>RENOLIN D 22 PLUS</b>		854	218	22	4.3	106	-42	
<b>RENOLIN D 32 PLUS</b>		861	236	32	5.5	108	-39	
<b>RENOLIN D 46 PLUS</b>		866	252	46	6.9	106	-36	
<b>RENOLIN D 68 PLUS</b>		869	258	68	9.0	105	-36	
<b>RENOLIN D 22 HVI PLUS</b>	<b>Range RENOLIN D HVI Plus</b> Detergent multigrade hydraulic oil based on highquality hydrated base oils (Group II). Zinc-containing AW/EP additive system offers excellent wear protection. Good shear-stability, excellent oxidation stability and additives to improve ageing resistance offer long lifetime.  DIN 51524-3: HVLP-D ISO 6743-4: HV (with DD-properties)	847	210	22	4.9	150	-48	RENOLIN D HVI Plus can be used in stationary and mobile hydraulic equipment like machine tools or excavators. The high viscosity index and good cold-temperature behaviour offers advantages at changing environmental conditions.  Hydraulic fluid with good DD-properties  DIN 51524-3: HVLP-D ISO 6743-4: HV (with DD-properties)
<b>RENOLIN D 32 HVI PLUS</b>		850	230	32	6.3	150	-42	
<b>RENOLIN D 46 HVI PLUS</b>		858	238	46	8.2	150	-42	
<b>RENOLIN D 68 HVI PLUS</b>		858	254	68	10.7	145	-39	

## 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 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 behaviour, long lifetime, excellent corrosion protection and very good zinc-containing wear protection for high pressure - good demulsifying properties.  Fulfils and surpasses: DIN 51524-3: HVLP ISO 6743-4: HV ISO 11158: HV  Denison HF0 Bosch Rexroth RD 90235 / RDE 90245	845	216	32	6.9	180	-33	Universal high-performance multigrade hydraulic oils 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 help to avoid stick-slip phenomena. For high-pressure applications; reduce friction especially in mixed friction conditions  DIN 51524-3: 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 oils for stationary and mobile hydraulic systems surpass HVLPD acc. to DIN 51524-3, wide temperature window, excellent shear stability. Help 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.  Zinc-containing; fulfils and surpasses requirements according to: DIN 51524-2: HLPD ISO 11158: HM ISO 6743-4: HM/HG	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	

# RENOLIN

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<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 51502 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 fulfil all requirements. Excellent oxidation stability based on highquality hydrated base oils (Group II).	823	75	2,2	–	–	-54	<u>RENOLIN MR 0, 1 and 3:</u> For machine tool spindles and roller bearing spindles in the textile industry.
<b>RENOLIN MR 1 VG 5</b>		834	135	4,6	1.7	–	-54	
<b>RENOLIN MR 3 VG 10</b>		840	170	10	2.7	106	-54	
<b>RENOLIN MR 5 VG 22</b>		846	210	22	4.5	118	-45	<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 gear boxes, in particular with electrical multi-plate clutches.
<b>RENOLIN MR 10 VG 32</b>		866	220	32	5.5	109	-39	
<b>RENOLIN MR 15 VG 46</b>		868	230	46	7.0	107	-36	High DD performance
<b>RENOLIN MR 20 VG 68</b>		871	230	68	9.0	107	-33	<u>RENOLIN MR 30, 40:</u> For larger gear boxes. As running-in and anticorrosion oil. Allows oil changes to be extended.
<b>RENOLIN MR 30 VG 100</b>		874	270	100	11.6	104	-33	
<b>RENOLIN MR 40 VG 150</b>		881	280	150	15.1	101	-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. HVLPD according to DIN 51502 together with DIN 51524-HVLPD 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. HVLP according to DIN 51524-3		847	210	22	4.9	150	-48
<b>RENOLIN MR 32 MC</b>		848	230	32	6.3	150	-45	
<b>RENOLIN MR 46 MC</b>		854	240	46	8.1	150	-42	
<b>RENOLIN MR 68 MC</b>		856	260	68	10.9	150	-39	
<b>RENOLIN MRX 46</b>	Selected, and high quality special refined oil with additives to maximize ageing protection, reduce wear and friction. High detergent and sludge carrying capacity; excellent protection against corrosion: DIN 51524: HLPD MRX 46: HLPD 46	884	232	46	6.9	103	-24	The RENOLIN MRX 46 hydraulic and lubricating oil is especially recommended for systems which are exposed to a high risk of dust/dirt or water contamination, e.g. for mobile hydraulic systems, for running-in procedures or in agriculture and forestry applications.

## 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 FF 68 Spindelöl</b>	<p>Ultra-pure and fine-filtrated lubrication oil for tool spindles - formulated on special partly synthetic base oils. A very high and shear stable viscosity index guarantees a stable lubricant film, even at high temperatures.</p> <p>The complex filtration process effects a very good cleanliness of 15/13/10 acc.to ISO 4406.</p> <p>Very good detergent and dispersant properties.</p> <p>Fulfils and surpasses: DIN 51524-3: HVLDP ISO 6743-4: HV (with DD properties)</p>	870	253	68	11.2	157	-42	<p>For lubrication of tool spindles. High dirt carrying property prevents of sludge and varnish, partly synthetic base oils guarantee very good oxidation and ageing stability.</p> <p>Cleanliness class 15/13/10 acc. to ISO 6743</p> <p>Fulfils and surpasses requirements acc. to: DIN 51524-3: HVLDP ISO 6743-4: HV (with DD properties)</p>

# 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 51524-2 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 (FZG > 12) and roller bearings. High corrosion protection, even in the presence of water, excellent non-ferrous metal compatibility.  HLP according to DIN 51524-2 HM acc. to ISO 6743-4 HM acc. to ISO 11158 CLP acc. to DIN 51517-3 CKC acc. to ISO 6743-6 (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. Fulfils and surpasses requirements according to DIN 51524-2: HLP; HM acc. to ISO 6743-4 HM acc. to ISO 11158	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. Fulfils and surpasses requirements acc. to DIN 51524-2: HLP-D ISO 6743-4: HM DIN 51517-3: 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 51524-2: HLPD ISO 6743-4: HM DIN 51517-3: 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 $\geq 30$ 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 51524-2: 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 51524-2 (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. Fulfil and surpass DIN 51524-2: HLPD (except detergent / dispersant). ISO 11158: HM CLP acc. to DIN 51517-3 (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 $\geq 50$ 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). Fulfil and surpass DIN 51524-2: HLP DIN 51524-3: HVLP ISO 6743-4: HM ISO 6743-4: HV DIN 51517-3: 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	

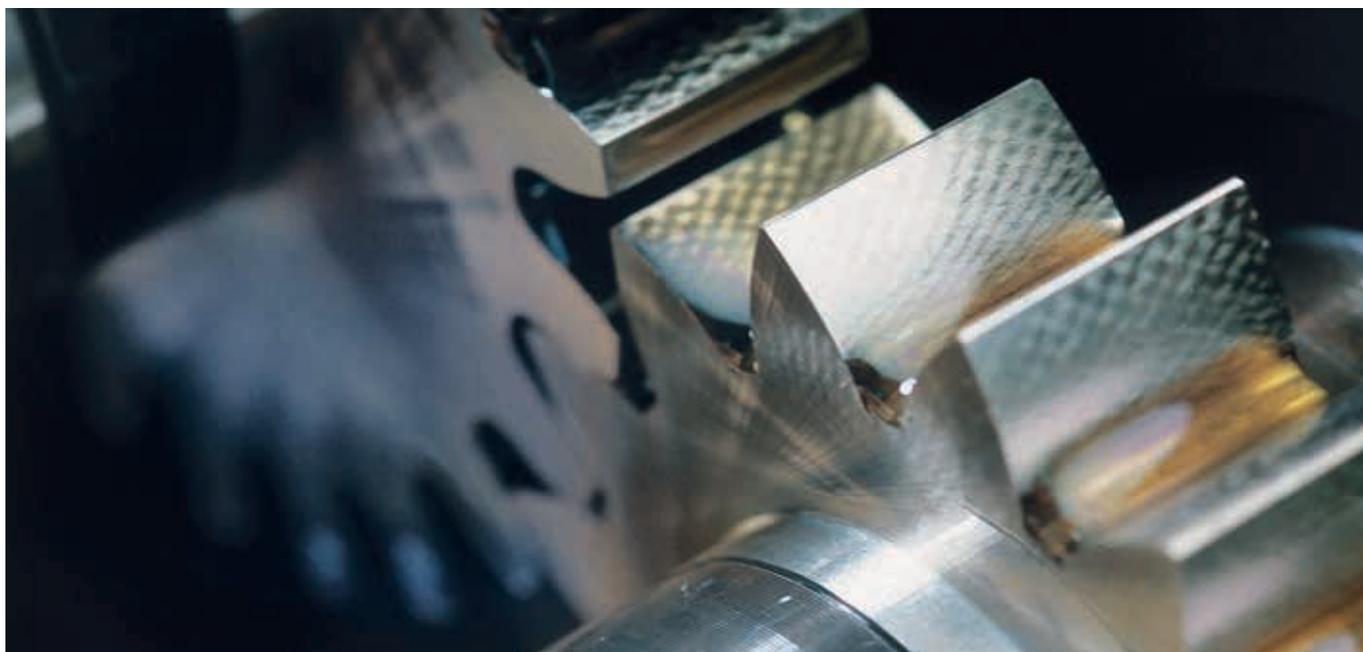
# RENOLIN

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>Zinc- and Ash-free Hydraulic Oils (ZAF)</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. Fulfils and surpasses DIN 51524-3: HVLP; ISO 6743-4: HV	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 51524-3: HVLP; ISO 6743-4: HV	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) Demulsifying type. Kinematic viscosity at -40 °C: - RENOLIN ZAF 15 LT = 2380 mm <sup>2</sup> /s - RENOLIN ZAF 32 LT = 4850 mm <sup>2</sup> /s
<b>RENOLIN ZAF 32 LT</b>		869	155	31	8.7	281	<-60	
<b>RENOLIN ZAF 32 XHV</b>	Newly designed zinc- and ash-free hydraulic oil with very high shear stable viscosity index, which allows outstanding low-temperature properties. Demulsifying, with additives for an excellent compatibility with non-ferrous metals and a high wear protection. Fulfils the requirements according to DIN 51524-3: HVLP and ISO 6743-4: HV (with exception of the flashpoint).	853	135	32	9.5	300	≤-51	Developed for applications which require a very good flow behavior also at low temperatures.  Kinematic viscosity at -40 °C = 2150 mm <sup>2</sup> /s
<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> ). Fulfils and surpasses the requirements on hydraulic oils acc. to DIN 51524-2: HLPD and ISO 11158: HM together with DIN 51502	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 24 568 PG 32: HEPG 32 PG 46: HEPG 46 Fulfil and surpass the requirements on hydraulic oils HVLP acc. to DIN 51524-3.	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

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 51502 and VDMA 24 317, ISO 12922: HFC 46.	1084	–	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>HYDROTHERM 42 HFC</b>	New developed HFC fluid, fire-resistant hydraulic fluid (according to ISO 12922), based on water-glycol and modern additive system. Excellent wear protection and superior air release properties in combination with very good corrosion protection. Fulfills and surpasses requirements on HFC fluids according to: DIN 51502: HFC ISO 12922: HFC VDMA 24317: HFC	1084	–	42	8.9	195	<-60	For hydraulic systems in fire hazard areas, if HFC fluids are required. Fulfills requirements according to 7th Luxembourg Report.
<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>	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	316	50	10.1	195	-48	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 lifetime, 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.	932	316	70	12.9	187	-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 ageing 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 behaviour, zinc-free and silicone oil-free. RENOLIN CLP oils fulfil and exceed the minimum requirements of CLP industrial gear oils according to DIN 51517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKSMP. US Steel 224, David Brown S1.53.10.	886	> 230	68	8.7	99	-24	Universally useable gear oils for industrial applications such as in bearings, joints, spur gears, bevel gears and worm gears and whenever the manufacturer recommends a mineral oil of type CLP.  Approved by leading gear box manufacturers.  <b>Mineral oil based</b> Demulsifying
<b>RENOLIN CLP 100</b>		890	> 230	100	11.2	98	-21	
<b>RENOLIN CLP 150</b>		894	> 230	150	14.5	96	-24	
<b>RENOLIN CLP 220</b>		896	> 230	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 fulfil and surpass the minimum requirements on lubricating oils acc. to DIN 51517-3: CLPD, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKSMP. RENOLIN CLP PLUS oils were developed especially for the extreme conditions (e.g. in surface mining).	882	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). Especially for use in severe conditions where dirt, dust and water contamination prevail.  Increased oxidation stability.  <b>Mineral oil based</b>
<b>RENOLIN CLP 68 PLUS</b>		884	236	68	8.7	100	-27	
<b>RENOLIN CLP 100 PLUS</b>		887	240	100	11.2	97	-24	
<b>RENOLIN CLP 150 PLUS</b>		892	250	150	14.8	97	-24	
<b>RENOLIN CLP 220 PLUS</b>		895	260	220	18.9	96	-24	
<b>RENOLIN CLP 320 PLUS</b>		898	255	320	24.0	95	-18	
<b>RENOLIN CLP 460 PLUS</b>		902	270	460	30.2	94	-14	
<b>RENOLIN CLP 680 PLUS</b>		902	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 (typical: >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 51517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKSMP. Approved by leading press manufacturers.	882	221	68	8.9	105	-24	For highly-stressed industrial gear boxes and circulating systems, especially when good load carrying capacity in extreme mixed friction is required, e.g. press lines in the automotive industry.  <b>Mineral oil based</b>
<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>Fully Synthetic Gear and Circulating Oils</b>								
<b>RENOLIN PG 32</b>	<b>Range RENOLIN PG</b> Fully synthetic gear and lubricating oils based on special polyalkylene glycols (PAG) for applications with extreme thermal loads. Very 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 high micropitting resistance, excellent FE8 performance. The oils of the RENOLIN PG series surpass the minimum requirements of CLP-PG lubricating oils according to DIN 51517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE, CKSMP, CSPG, CTPG. Approved by leading gear box manufacturers.	1022	220	32	7.1	194	-54	For gear boxes 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. Change-over guidelines must be observed.
<b>RENOLIN PG 46</b>		1029	240	46	9.7	203	-48	
<b>RENOLIN PG 68</b>		1035	240	68	13.8	212	-48	
<b>RENOLIN PG 100</b>		1043	260	100	19.6	220	-48	
<b>RENOLIN PG 150</b>		1051	260	145	27.0	224	-48	
<b>RENOLIN PG 220</b>		1075	240	220	36.8	220	-33	
<b>RENOLIN PG 320</b>		1075	240	320	54.4	237	-33	
<b>RENOLIN PG 460</b>		1075	280	460	75.1	245	-33	
<b>RENOLIN PG 680</b>		1075	280	680	110.3	261	-33	
<b>RENOLIN PG 1000</b>		1075	280	1000	162.0	281	-33	
<b>RENOLIN PG 1500</b>		1075	280	1500	240.0	300	-18	
<b>RENOLIN UNISYN XT 68</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 and very good corrosion protection. RENOLIN UNISYN XT oils exceed the requirements on industrial gear oils CLP-HC acc. to DIN 51517-3, ISO 6743-6, ISO 12925-1: CKC, CKD, CKE, CKSMP and AGMA 9005/E02: EP.	850	238	68	11.0	154	-54	Suitable for the lubrication of gears and bearings. For the use in applications with high requirements on wide temperature range. Extreme low viscosity at low temperatures.  ISO VG 220 and 320 for wind turbine applications.  Approved by leading gear box manufacturers.
<b>RENOLIN UNISYN XT 100</b>		850	238	100	15.3	162	-48	
<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>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>Based on Polyglycol</b>								
<b>Based on PAO (Polyalphaolefins)</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>Gear and Circulation Oils</b>									
<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 EP / AW additives and 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 CLP lubricating oils acc. to DIN 51517-3, ISO 6743-6 and ISO 12925-1: CKC, CKD	891	240	100	11.2	98	-21	For highly-loaded gear boxes, 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 gear boxes 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>
<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 150</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 51517-3: CLP, ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE, CKSMP	894	>210	150	14.6	96	-21	RENOLIN HighGear can be used both in pre-damaged gear boxes and machine components to increase service life as well as in new gear boxes (spur, bevel, planetary and worm gears) to reduce friction, wear and noise in extreme conditions.	
<b>RENOLIN HighGear 220</b>		899	>210	220	19.0	97	-18		
<b>RENOLIN HighGear 320</b>		904	>210	320	24.3	97	-12		
<b>RENOLIN HighGear 460</b>		909	>210	460	30.8	97	-9		<b>Mineral oil based</b>
<b>RENOLIN HighGear 680</b>		907	>210	680	51.4	98	-9		

# 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>Special 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 51517-3: CLP; ISO 6743-6 and ISO 12925-1: CKC, CKD, CKE, CKSMP.	871	220	150	18.0	133	-36	RENOLIN HighGear Synth can be used both in pre-damaged gear boxes and machine components to increase service life as well as in new gear boxes (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>RENOLIN HighGear Synth 220</b>		899	>220	220	19.0	97	-18	
<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	
*Further ISO VG grades available on request.								<b>Based on PAO (Polyalphaolefins)</b>
<b>RENOLIN MORGEAR 100</b>	<b>Range RENOLIN MORGEAR</b> High-performance circulating oils based on mineral oil, for the lubrication of MORGOL 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 MORGOL bearings. RENOLIN MORGEAR oils fulfil and surpass the requirements of DANIELI (Italy) and SMS.
<b>RENOLIN MORGEAR 220</b>		895	255	226	19.2	96	-10	
<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>Mineral oil based</b>
<b>RENOLIN CLP 220 VCI</b>	<b>Range RENOLIN CLP VCI*</b> Special industrial gear oils based on mineral oil with VCI components (Vapour Corrosion Inhibitors). 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 51517-3: 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 (Vapour Corrosion Inhibitors).
<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>Mineral oil based</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>Special Gear and Circulating Oils</b>								
<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 due to VCI components (Vapour Corrosion Inhibitors). 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 51517-3: 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. Especially for high operating temperatures. Contains VCI components (Vapour Corrosion Inhibitors).  <b>Based on PAO</b>
*Further ISO VG grades available on request.								
<b>RENOFLUID TF 1500</b>	Special 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 51524-2: 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>
<b>Special Corrosion Protection Concentrate</b>								
<b>RENOLIN VCI BOOST</b>	Additive concentrate for the use in FUCHS gear, hydraulic and turbine oils. Contains VCI components (VCI = Vapour Corrosion Inhibitor).	905	155	105	12.5	112	-12	Universal VCI corrosion protection concentrate for the use in RENOLIN industrial oils. Easy dosage and usage. Treat rate 2%

## RENOLIN, 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 CGLP 68</b>	<b>Range RENEP CGLP</b> Mineral oil based slideway oils with lubricity improvers and friction-reducing additives. Good EP performance. Protect against corrosion and prevent stick-slip. CGLP slideway oils according to DIN 51502. 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 compability 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 2 K</b>	<b>Range RENEP K</b> Slideway oils 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	Suitable for all slideway applications. RENEP 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 KN 68</b>	<b>Range RENEP 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 220: CGLP 220	882	220	67	9.1	110	-29	Excellent chemical compability with water-miscible metal working fluids. Slideway oils with very good demulsifying properties, low friction coefficient. Containing tackyfier.  Approved by leading machine tool manufacturers.  Especially suitable for the use with ECOCOOOL cutting fluids.
<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 fulfil and exceed the minimum requirements on CLP gear oils acc. to DIN 51517-3 and the requirements of paper machine oils for the wet end and dryer section acc. to Voith VN 108.	878	>230	150	15.0	100	-30	Recommended for the use in wet end and dryer sections in paper machines, also in gear boxes, 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 base oils.  <b>Mineral oil base</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. Fulfil and exceed the minimum requirements of gear oils CLP-HC acc. to DIN 51517-3.	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 gear boxes and central lubricating systems. Especially for higher operating temperatures.
<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 220 PA</b> Fulfil and exceed the minimum requirements of the companies SKF, FAG and Voith VN 108
<b>RENOLIN UNISYN CLP 460 PA</b>		866	>240	460	46.0	156	-27	<b>Based on PAO</b>
<b>RENOLIN SynGear 220 HT</b>		1078	240	240	39.0	216	-36	For mechanically and thermally highly loaded wheel and worm gears / rolling and plain bearings. Especially for calenders 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



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 51515-1: L-TDP and DIN 51515-2: 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 51515-1/2. 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 51515-1: TD; DIN 51515-2: 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 51515-1/2.
<b>RENOLIN ETERNA 46 SGV</b>		846	220	46	7.6	132	-15	
<b>RENOLIN ETERNA Clean</b>	Polar cleaning fluid for turbine oil circuits. Compatible with all common turbine oils. Free from detergents: No deterioration of the air and water separation behaviour and other negative impacts which occur with conventional cleaners. RENOLIN ETERNA Clean contains a complete additive system. Therefore, a "weakening" of the turbine oil filling - arising by addition of other cleaners - will be prevented.	910	220	29	4.84	–	-42	With RENOLIN ETERNA Clean old deposits, varnish and other oil degradation products can effectively be removed from the turbine oil system before an intended oil change. There will be no impairment of the new filling. Addition of approx. 5 – 10% to the existing turbine oil filling.

# 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. Fulfils and surpasses the requirements for insulating oils according to IEC 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>	Non-inhibited insulating oil based on naphthenic base oils. Meets the requirements for insulating oils according to IEC 60296.	869	149*	9.9	2.4	59	-48	RENOLIN ELTEC 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 E 3</b>	Inhibited switchgear oil based on naphthenic base oils. Especially for the use in outdoor units. Fulfils the requirements according to IEC 60296.	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>Screw Compressor Oils</b>								
<b>RENOLIN SilverScrew 32</b>	<b>Range RENOLIN SilverScrew</b> High-tech air compressor fluids with high oxidative and thermal stability, which allows oil lifetimes of up to 6000h.	863	235	32	5.5	108	-38	Universal air compressor fluids for oil injected screw, vane and piston compressors.
<b>RENOLIN SilverScrew 46</b>		868	244	46	6.9	105	-36	
<b>RENOLIN SilverScrew 68</b>		870	255	68	9.0	106	-40	
<b>RENOLIN GoldScrew 46</b>	<b>Range RENOLIN GoldScrew</b> Outstanding high-tech air compressor fluids with excellent oxidative and thermal stability, which allows oil lifetimes of up to 9000h.  Surpasses the requirements of DIN 51506:VDL. Corresponds to ISO 6743-3-DAJ. Corresponds to several OEM Requirements.	855	260	46	7.6	131	-39	Universal air compressor fluids for oil injected screw, vane and piston compressors.
<b>RENOLIN GoldScrew 68</b>		871	278	68	9.4	117	-33	

# 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>Screw 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 51506 and synthetic hydraulic oils according to DIN 51524-2/3.	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>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 SynAir 46</b>	High performance synthetic air compressor fluid, excellent biodegradability according to OECD 301C > 60%. Excellent thermal and oxidation stability. Guarantee a reliable corrosion protection and compatibility with elastomers	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>Piston and Rotary Vane Compressor Oils</b>								
<b>RENOLIN 503</b>	<b>Range RENOLIN 500</b> Special ageing-resistant lubricating oils offering minimal coking. Contain additives to improve corrosion protection and ageing stability. VDL lubricating oils according to DIN 51506. 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-ageing behaviour 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 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.
<b>RENOLIN SE 100</b>	Fully-synthetic air compressor oil based on advanced synthetic ester technology.  Fulfils the requirements according to VDL DIN 51506	972	270	100	10.3	81	-42	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.

## 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>Gas Compressor Oils</b>								
<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 LGP 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>RENOLIN LPG 185</b>		1012	280	185	29.0	197	-36	

## RENOLIN, 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 51503: 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 51503: 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	
<b>RENISO KW 150</b>		917	2185	150	10.9	27	-30	

## 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 51503: 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 51503: 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>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 51503: 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>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>		<b>NEW:</b> RENISO TRITON SE/SEZ is also suitable for the use with HFO and HFO/HFC refrigerants.	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>		RENISO TRITON SEZ 320 was developed especially for application with R22. DIN 51503: KC, KD.	1016	278	310	33.0	148		-42
<b>RENISO TRITON SEZ 35 SC</b>		For HFC/FC refrigerants. Specially developed for scroll compressors. DIN 51503: KD.	1015	256	34	6.3	138		-51
<b>RENISO LPG 68</b>	Synthetic refrigeration oil based on polyalkylene glycols (PAG). For hydrocarbon refrigerants. Controlled hydrocarbon solvency for less viscosity reduction. DIN 51503 - KE	989	269	67	11.9	180	-45	Synthetic refrigeration oil based on polyalkylene glycols (PAG) for piston compressors. Especially suitable for hydrocarbon refrigerants.	

# 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 51503: 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>RENISO UltraCool 68</b>	Refrigeration oil based on synthetic hydrocarbons. Particularly developed for ammonia applications. DIN 51503: 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 UltraCool 100</b>		857	239	108	14.4	136	-46	
<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 51503: KAB, KE.	1044	250	70	14.0	210	-52	RENISO PG 68 is an ultra-dried, synthetic refrigeration oil based on PAG for NH <sub>3</sub> systems which operate on the principle of direct expansion. Suitable for screw and reciprocating piston compressors. RENISO PG 68 and GL 68 are also recommended for the use with hydrocarbon refrigerants.  <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. RENISO PAG 46 and PAG 100 can be used together with hydrocarbon refrigerant and ammonia.
<b>RENISO PAG 100</b>	Also suitable for hydrocarbon applications. DIN 51503: KAB, KD, KE.	996	240	120	21.0	202	-45	
<b>RENISO PAG 1234</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 51503: 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 additivation of RENISO PAG 1234 guarantee best lubrication properties and wear protection.

## 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 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 51503: KB, KD, KE.	1077	250	226	39.1	226	-39	Refrigeration oil based on polyalkylene glycols (PAGs). For HFC refrigerants like R134a. Especially suitable for screw compressors in heat pump applications for industrial and commercial use. Also suitable for hydrocarbon and CO <sub>2</sub> applications (CO <sub>2</sub> non-miscible oil)
<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 51503: KB.  <b>Based on special double end-capped PAG</b>	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>	Synthetic refrigeration oil based on special, double end-capped PAGs for transcritical CO <sub>2</sub> application. Especially developed for automotive A/C systems. DIN 51503: KB.	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 51503: 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 and 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	

## RENISO, 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</b>								
<b>PLANTOHYD 15 S*</b>	<b>Range PLANTOHYD S</b> Synthetic ester oils with additives to increase ageing stability. Rapidly biodegradable according to OECD 301 B > 60%. High wear protection (FZG stage 12). Surpass the requirements acc. to ISO 15380: "HEES". Awarded the EU Ecolabel (EEL).	893	200	15	4.1	191	-33	Universally useable. Especially recommended for hydraulic systems from -30 °C to +90 °C (oil sump temperature). The changeover guidelines according to 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	
<b>PLANTOSYN 32 HVI*</b>	<b>Range PLANTOSYN HVI</b> Environmentally friendly hydraulic and circulating oils based on synthetic saturated esters. Rapidly biodegradable acc. to OECD 301 B > 60%. High wear protection, good seal and non-ferrous metal compatibility, excellent oxidation stability. Fulfils the requirements of HEES hydraulic oils according to DIN ISO 15380 and HVLP according to DIN 51524-3. Awarded the EU Ecolabel (EEL).	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 changing-over to PLANTOSYN HVI products. 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	

## 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</b>								
<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 pourpoint. Thanks to their very high VI they can be used in a wide temperature range. PLANTOLUBE POLAR S oils offer outstanding protection against corrosion and wear. Highly ageing resistant. Surpass the requirements of DIN 51524-3: HVLP ISO 15380: HEES.	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</b>								
<b>PLANTOGEAR 100 HVI*</b>	<b>Range PLANTOGEAR HVI</b> Environmentally friendly circulation 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 51517-3: CLP and AGMA 9005 / E02: EP Awarded the EU Ecolabel (EEL).	927	>270	100	13.7	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. The changeover guidelines according to DIN ISO 15380 must be observed.
<b>PLANTOGEAR 150 HVI*</b>		928	>270	150	19.1	145	-30	
<b>PLANTOGEAR 220 S*</b>	<b>Range PLANTOGEAR S</b> Rapidly biodegradable high-performance gear oils based on special, saturated esters. Extremely high thermal and ageing stability, high viscosity index, good viscosity-temperature behaviour. 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 51517-3 together with DIN 51502; 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 (EEL).	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, shearstable 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	

# 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 Slideway Oils / Lubrication Oils</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>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 behaviour and adhesive properties and excellent wear protection. FZG A/8.3/90 failure load stage > 12. 220 N: CG 220 320 N: CG 320	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 100 S</b>		PLANTOTAC HV-N oils are based on ageing-stable synthetic esters. 100 S: CG 100	924	300	100	17.5	193	
<b>PLANTO SCHALUNGSÖL N*</b>	Mould release oil based on vegetable oil. Rapidly biodegradable. With additives to increase ageing stability. Awarded the EU Ecolabel (EEL).	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>	Mould release oil based on synthetic esters with additives to increase ageing 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 51510.	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 tacky and lubricating oils based on mineral oils with lubricity improvers and anti-wear agents. Good EP and adhesive performance (tackiness). Lubricants for all total-loss applications (plain bearings, slideways, guides etc.).  343: CG(L) 100 344: CG(L) 150 345: CG(L) 220 347: CG(L) 320	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	
<b>RENOTAC 347</b>		899	260	321	24.5	98	-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>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 show very good demulsibility. 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	
<b>Pneumatic Oils</b>								
<b>RENOLIN Abbaudhammeröl DA</b>	Mineraloils with anti-wear and anti-corrosion additives as well as special detergent/dispersant additives for excellent self-cleaning properties. Condensed water is emulsified..	876	210	33	5.5	102	-33	For jack hammers and other pneumatic tools, at ambient temperatures above 0 °C.
<b>RENOLIN Bohrhammeröl DL 68</b>		886	212	85	10.0	96	-15	
<b>RENOLIN SDL 1808</b>	Fully synthetic pneumatic oil with high wear and corrosion protection.	1116	140	11	2.2	–	-51	Also for ambient temperatures below -3 °C; prevents freezing of valves and other components contaminated by moisture.
<b>Test Oils</b>								
<b>Reference Oil IRM 901</b>	Reference oils for laboratories	882	243	231	19.1	93	-12	For laboratory tests; principally for elastomer compatibility tests. In exchange for old ASTM test oils.
<b>Reference Oil IRM 902</b>		935	243	441	18.8	–	–	
<b>Reference Oil IRM 903</b>		920	171	29.5	15.4	104	-33	
<b>RENOLIN FST 101</b>	Leakage test oil concentrate	1007	93	39.2	–	–	-33	
<b>PRÜFFARBSTOFF blau</b>	Leakage test oil concentrate	990	–	–	–	–	–	

# 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

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## 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>Multipurpose / Longlife Greases</b>								
<b>PLANTOGEL ECO 2 FS</b>	–	Li/Ca synth. ester	•	2	200	-30 / +120	–	Rapidly biodegradable EP multipurpose grease with solid lubrications for lubrication of plain and roller bearings, e.g. commercial vehicles and construction machinery.
<b>PLANTOGEL ECO 2 S</b>	–	Li/Ca synth. ester	–	2	110	-40 / +120	EU 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 lubricating systems.
<b>PLANTOGEL ECO 402 S</b>	–	Ca synth. ester	–	2	390	-40 / +120	EU Ecolabel 	High performance bio-grease, water (salt water) resistant.
<b>RENOLIT CA-LZ</b> (Spray can: RENOLIT CA-LZ SPRAY)	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 LX 1</b>	–	Li-X Mineral oil	–	1	160	-30 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO

## PLANTO, 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, re- commendations	Main application area
<b>Multipurpose / Longlife Greases</b>								
<b>RENOLIT LX 2</b>	–	Li-X Mineral oil	–	2	160	-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 LX 3</b>	–	Li-X Mineral oil	–	3	160	-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 FEP 2</b>	KP2N-20 ISO-L-X- BDEB 2	Lithium Mineral oil	–	2	220	-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	220	-20 / +140	–	Steel mills, quarries, construction equipment and forging presses
<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 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 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

## 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 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 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.

## RENOLIT, PLANTO



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 FS</b>	–	Li/Ca synth. ester	•	2	200	-30 / +120	–	Rapidly biodegradable EP multipurpose grease with solid lubrications for lubrication of plain and roller bearings, e.g. commercial vehicles and construction machinery.
<b>PLANTOGEL ECO 2 S</b>	–	Li/Ca synth. Ester	–	2	110	-40 / +120	EU 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 lubricating systems.
<b>PLANTOGEL ECO 402 S</b>	–	Ca synth. ester	–	2	390	-40 / +120	EU Ecolabel 	High performance bio-grease, water (salt water) resistant.
<b>RENOLIT CA-LZ</b> (Spray can: RENOLIT CA-LZ SPRAY)	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

## 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 Plain and Roller Bearings</b>								
<b>RENOLIT CSX 15</b>	–	CaSX Mineral oil	–	1-2	440	-20 / +180	A. Kahl Pelletpressen	Lubrication of high loaded, low speed plain and roller bearings and can be applied when the grease has to meet high demands on corrosion protection and working stability.; is easily pumpable even in long tubes fed by centralised lubrication systems. Typical applications are plain and roller bearings in steel mills, wood pellet presses, paper industry, mining, cement mills, quarries and construction equipment.
<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.
<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 2</b>	–	CaSX Mineral oil	•	2	400	-20 / +180	–	Lubrication of high loaded, low speed plain and roller bearings, e.g. for kiln cars, construction machinery, steel mills, coal and ore mills.
<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	400	-20 / +160	–	Lubrication of high loaded, low speed plain and roller bearings and can be applied when the grease has to meet high demands on corrosion protection and working stability. Typical applications are plain and roller bearings in steel mills, paper industry, mining, concrete industry, quarries and construction equipment.
<b>RENOLIT LX 1</b>	–	Li-X Mineral oil	–	1	160	-30 / +160	–	Roller bearings, electric motor bearings, coupling bearings in the automotive sector, construction machines, forging presses by EUMUCO
<b>RENOLIT LX 2</b>	–	Li-X Mineral oil	–	2	160	-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

# 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 LX 3</b>	–	Li-X Mineral oil	–	3	160	-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>	–	Li/Ca Mineral oil	–	2	500	-20 / +140	–	For high loaded plain and roller bearings with slow sliding speeds.
<b>RENOLIT FEP 2</b>	KP2N-20 ISO-L-X- BDEB 2	Lithium Mineral oil	–	2	220	-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	220	-20 / +140	–	Steel mills, quarries, construction equipment and forging presses
<b>RENOLIT FLM 0</b>	–	Lithium Mineral oil	•	0	100	-30 / +120	–	For mechanically loaded lubricating points, grease with MoS <sub>2</sub> , and additives to improve corrosion protection, EP and AW
<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

# 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 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 HI-TEMP 100</b>	KPHC2N-50 ISO-L-X-ED- FB 2	Li-X PAO	–	2	100	-50 / +140	–	Used in a wide temperature range for lubrication of plain and roller bearings of, e.g., electric motors, traction motors, bearings and car-dan shafts in polar regions.
<b>RENOLIT HI-TEMP 220</b>	KPHC2N-40 ISO-L-X- DDFB 2	Li-X PAO	–	2	220	-40 / +140	–	Used in a wide temperature range for lubrication of plain and roller bearings of, e.g. paper mills (wet sector), truck hub units, and car-dan shafts.
<b>RENOLIT HI-TEMP 460</b>	KPHC2N-40 ISO-L-X- DDFB 2	Li-X PAO	–	2	460	-40 / +140	–	Lubrication of plain and roller bearings of conveyor gears (e.g. in open cast mining), pellet presses, paper mills, and for lifetime lubrication in trucks and construc-tion machines.
<b>RENOLIT HLT 2</b>	KPHC2N-40 ISO-L-XD(F) DBB 2	Lithium PAO	–	2	105	-40 / +140	–	For lubricating points at changing ambient temperatures and high requirements, e. g. lifetime lubri-cation of pneumatic applications, centrifuges, plain and roller bear-ings
<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, lubri-cation 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
<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 bear-ings of motor vehicles, roller bear-ings 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 bear-ings of motor vehicles, roller bear-ings 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]	Appro- vals, re- commen- dations	Main application area
<b>Greases for Plain and Roller Bearings</b>								
<b>RENOLIT LZR 2 H</b>	KP2N-30 ISO-L-X- CDIB 2	Lithium Mineral oil	–	2	230	-30 / +140	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 compatibel
<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 (asphalt pavers)
<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
<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 M 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, re- commen- dations	Main application area
<b>Greases for Plain and Roller Bearings</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

## PLANTO, RENOLIT

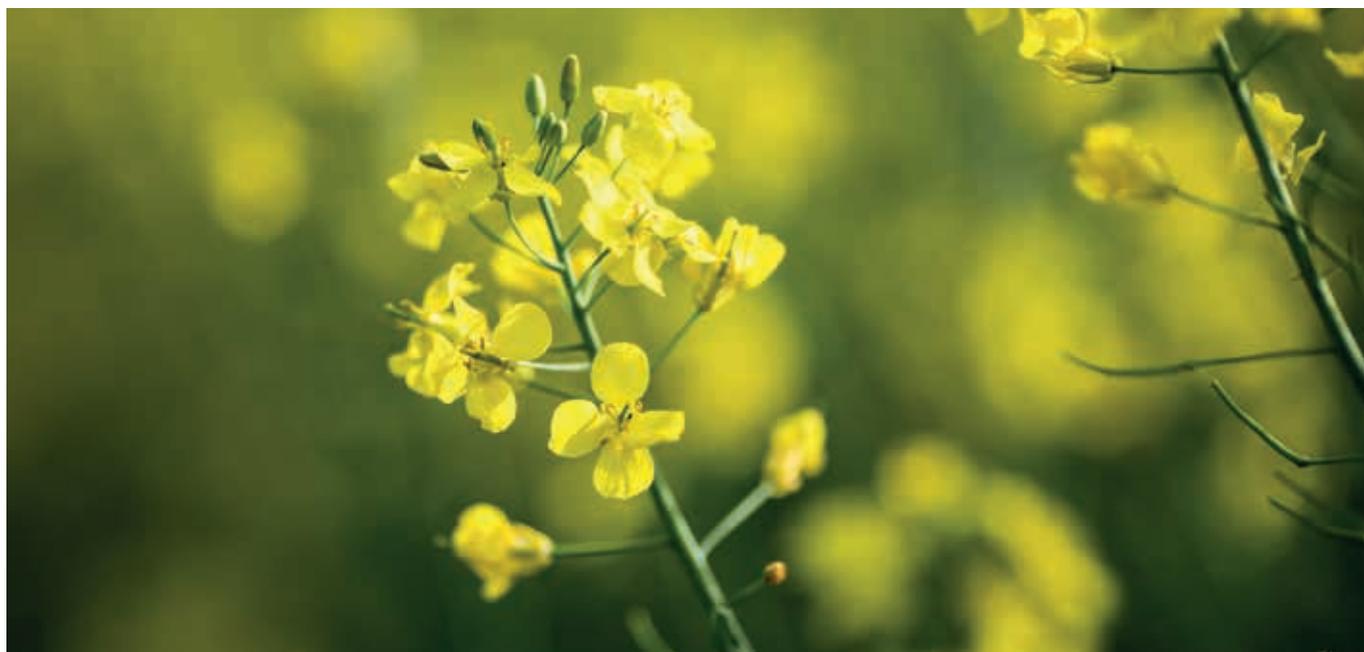


Product name	Classification DIN 51502 ISO 6743-9	Thickener Base oil	Solid lubri- cants	NLGI grade	Base oil viscosi- ty at 40 °C [mm <sup>2</sup> /s]	Tem- pera- ture range [°C]	Approvals, recommen- dations	Main application area
<b>Greases for Gear Boxes</b>								
<b>PLANTOGEL ECO 000 S</b>	–	Li/Ca synth. ester	–	00-000	55	-40 / +120	–	Rapidly biodegradable semi-fluid grease for lubrication of plain and roller bearings in commercial vehicles and construction machinery with central lubrication systems. also for gear systems which are exposed to low to medium loads.
<b>RENOLIT CX-EP 0</b>	GP0N-30	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 2</b>	–	CaSX Mineral oil	•	2	400	-20/ +180	–	Lubrication of high loaded, low speed plain and roller bearings, e.g. for kiln cars, construction machinery, steel mills, coal and ore mills.
<b>RENOLIT EPLITH 00</b>	GP00K-10	Lithium Mineral oil	–	00	420	-10 / +120	Müller- Weingarten Schuler	Lubrication of worm gears, bevel gears, spiral-toothed and straight-toothed gears, e.g. forming presses, machine tools, industrial gears
<b>RENOLIT FLM 0</b>	–	Lithium Mineral oil	•	0	100	-30 / +120	–	For mechanically loaded lubricating points, grease with MoS <sub>2</sub> , and additives to improve corrosion protection, EP and AW

## 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 LZR 000</b>	GP00- 000G-40	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	Lithium Mineral oil	–	000	110	-30 / +120	–	Machine tools, labelling and packaging machines with central lubrication sys- tems, industrial gears.
<b>RENOLIT SO-GFB</b>	GP00H-30	Sodium Mineral oil	–	00	250	-30 / +100	Siemens Flender	Fast rotating gears, gear motors, drum motors, gear couplings
<b>RENOLIT SO-GFO 35</b>	GP0H-30	Sodium Mineral oil	–	0	250	-30 / +100	–	Fast rotating gears, agricultural machi- nes

## RENOLIT, PLANTO



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>Rapidly Biodegradable Greases</b>								
<b>PLANTOGEL ECO 1 N</b>	ISO-L-XB(F) BEA 1	Calcium Rape seed oil	–	1	36	-20 / +80	EU Ecolabel 	Rapidly biodegradable lubricating grease with EU Ecolabel, e.g. for lock gates or in agriculture and forestry.
<b>PLANTOGEL ECO 2 N</b>	ISO-L-XB(F) BEA 2	Calcium Rape seed oil	–	2	36	-20 / +80	EU Ecolabel 	
<b>PLANTOGEL ECO 000 S</b>	–	Li/Ca synth. ester	–	00-000	55	-40 / +120	–	Rapidly biodegradable semi-fluid grease for lubrication of plain and roller bearings in commercial vehicles and construction machinery with central lubrication systems. also for gear systems which are exposed to low to medium loads.
<b>PLANTOGEL ECO 2 S</b>	–	Li/Ca synth. ester	–	2	110	-40 / +120	EU 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 lubricating systems.
<b>PLANTOGEL ECO 2 FS</b>	–	Li/Ca synth. ester	•	2	200	-30 / +120	–	Rapidly biodegradable EP multipurpose grease with solid lubrications for lubrication of plain and roller bearings, e.g. commercial vehicles and construction machinery.
<b>PLANTOGEL ECO 402 S</b>	–	Ca synth. ester	–	2	390	-40 / +120	EU Ecolabel 	High performance bio-grease, water (salt water) resistant.

## 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 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 LX 2</b>	–	Li-X Mineral oil	–	2	160	-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	Lithium Mineral oil	–	00	420	-10 / +120	Müller- Weingarten Schuler	Lubrication of worm gears, bevel gears, spiral-toothed and straight-toothed gears, e.g. forming presses, machine tools, industrial gears
<b>RENOLIT FEP 2</b>	KP2N-20 ISO-L-X- BDEB 2	Lithium Mineral oil	–	2	220	-20 / +140	–	Steel mills, quarries, construction equipment and forging presses, machine tools

# 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 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, spindle lubrication in superheated steam valves, bearing seats on knuckle pins, or spline connections in length adjusters of cardan shafts
<b>RENOLIT SF 7-041</b>	GP000K-30	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-XD(F) DBB 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 (asphalt pavers)
<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 M 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 HI-TEMP 100</b>	KPHC2N-50 ISO-L-X-ED- FB 2	Li-X PAO	–	2	100	-50 / +140	–	Used in a wide temperature range for lubrication of plain and roller bearings of, e.g., electric motors, traction motors, bearings and cardan shafts in polar regions.
<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 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 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 Central Lubricating Systems</b>								
<b>PLANTOGEL ECO 000 S</b>	–	Li/Ca synth. ester	–	00-000	55	-40 / +120	–	Rapidly biodegradable semi-fluid grease for lubrication of plain and roller bearings in commercial vehicles and construction machinery with central lubrication systems. also for gear systems which are exposed to low to medium loads.
<b>PLANTOGEL ECO 2 S</b>	–	Li/Ca synth. ester	–	2	110	-40 / +120	EU Ecolabel 	Rapidly biodegradable EP multi-purpose grease for plain and roller bearing lubrication, e.g. water turbines or in agriculture and forestry. Good pumpability in central lubricating 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	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

## PLANTO, 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, recommenda- tions	Main application area
<b>Greases for Central Lubricating Systems</b>								
<b>RENOLIT LZR 2 H</b>	KP2N-30 ISO-L-X- CDIB 2	Lithium Mineral oil	–	2	230	-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
<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	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 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 with Solid Lubricants</b>								
<b>PLANTOGEL ECO 2 FS</b>	–	Li/Ca synth. ester	•	2	200	-30 / +120	–	Rapidly biodegradable EP multipur- pose grease with solid lubrications for lubrication of plain and roller bearings, e.g. commercial vehicles and construc- tion machinery.
<b>RENOLIT CX-HT 2</b>	–	CaSX Mineral oil	•	2	400	-20 / +180	–	Lubrication of high loaded, low speed plain and roller bearings, e.g. for kiln cars, construction machinery, steel mills, coal and ore mills.
<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, const- ruction 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 ageing 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

## PLANTO, 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 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.
<b>RENOLIT TFL 2</b>	–	Lithium PAO	•	2	110	-40 / +140	–	With PTFE, for slide-pairs with and without plastic components

## 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>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

## RENOLIT, PLANTO



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
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### Greases in Spray Cans or Rattle Cans

<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>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.
<b>RENOLIT CA-LZ SPRAY</b> (Grease: RENOLIT CA-LZ)	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

## 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 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 / +1,200	–	Assembly paste for prevent fretting corrosion , e.g. gears, electrical motors, etc., chucks, spindle lubrication in superheated steam valves, bearing seats on knuckle pins, or spline connections in length adjusters of cardan shafts

# 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 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 SI 708</b>	–	HDK Silicone oil	–	2-3	310	-40 / +200	–	Assembly aid for sealings, insulation grease

## 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
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### Greases for Special Applications

<b>RENOLIT FOL 2</b>	–	Lithium PAO	•	2	110	-10 / +21	MPA Stuttgart approved	Very ageing resistant, grease for sliding films in engineering, low sliding speed
<b>RENOLIT GL 1</b> (Spray can: RENAX GLEITSPRAY)	–	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.
<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 SI 410 M</b>	KSI2K-55 ISO-L-X- ECEA 2	Calcium Silicone oil	–	2	750	-55 / +120	eurofins (F)	Beer tap grease for lubrication of taps, bearings and sealings of fermentation and filling plants for beverages, food plants and packaging
<b>RENOLIT TFL 2</b>	–	Lithium PAO	•	2	110	-40 / +140	–	With PTFE, for slide-pairs with and without plastic components

# 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>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-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	Boron-free	Material Recommendations	Main application area
<b>Core Program</b>									
<b>ECOCOOL HPL 720 GT</b>	• (EP)	–	–	0.96	9.0	S, M, H	•	Steel alloyed steel, Al*	Multi-functional metalworking fluid, especially for difficult operations such as reaming and threading. GROB-Approval
<b>ECOCOOL FERROSTAR MBF</b>	–	• (ME EP)	–	0.97	9.6	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. GROB-Approval
<b>ECOCOOL AFC 1515</b>	•	–	–	0.95	9.4	S, M, H	•	Steel alloyed steel, Al*	For roughing and precision machining, as well as the grinding of steel and aluminium materials; excellent lubricity
<b>ECOCOOL R - 2030</b>	•	–	–	1.00	9.4	M, H	–	Steel, alloyed steel, cast iron, Al*	Metalworking fluid for general and precision machining (such as reaming); low foaming; low misting.
<b>ECOCOOL 68 CF 3-1</b>	–	• (ME)	–	1.02	9.4	M, 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	9.7	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

# ECOCOOL

Product name	Con-vent. Emulsion	Semi synth. Emulsion	Solution Fully synthetic	Density at 15 °C	pH Value 5%	Mixing water Hardness	Boron-free	Material Recommendations	Main application area
<b>Core Program</b>									
<b>ECOCOOL R - VHCM</b>	–	• (ME)	–	1.01	9.5	M, H	–	Steel, cast iron	Metalworking fluid for general machining operations; greater economy due to low drag-out losses. DMG MORI Approval
<b>ECOCOOL S-G2</b>	–	–	• (EP)	1.06	8.8	S, M	•	Steel, Al*	Fully-synthetic metalworking fluid for the most difficult machining and grinding operations on steel and aluminium alloys; very low foaming; suitable for high pressures and soft water; greater economy due to low drag-out losses
<b>ECOCOOL S-CP</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 TN 2530</b>	• (EP)	–	–	0.98	9.4	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
<b>ECOCOOL S-CO 5 BF</b>	–	–	•	1.10	8.8	S, M	•	Tungsten carbides, nonferros metals	Fully-synthetic metalworking fluid for the machining and grinding of tungsten carbides; reduces cobalt leaching; low drag-out losses
<b>ECOCOOL VHCM - 1</b>	–	• (ME EP)	–	0.99	9.4	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. Also available pre-preserved under ECOCOOL VHCM-1K.
<b>ECOCOOL ALUSTAR BF</b>	•	–	–	0.95	7.9	M	•	Steel, alloyed steel, Al*, zinc- and lead-containing nonferrous materials	High-quality, universal metalworking fluid, especially for machining of zinc- and lead-containing nonferrous materials and critical aluminium alloys; pH neutral; outstanding lubricity; good wetting and flushing properties

## Cutting Fluids – Water-miscible

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>Water-miscible Cutting Fluids with DMG MORI and DMQP Approval</b>									
<b>ECOCOOL R - VHCM</b>	–	• (ME)	–	1.01	9.5	M, H	–	Steel, cast iron	Cooling lubricant for general machining; low top up concentration required.  DMG MORI Approval
<b>ECOCOOL TNA-IDM</b>	• (EP)	–	–	0.96	9.0	S, M	•	Steel, Titanium and Ni alloys, Al (critical for staining)	High-performance product for for drilling, turning, milling and grinding of titanium-, nickel-based alloys, aluminium, stainless steel and steel.  DMQP Product
<b>ECOCOOL AFC-IDM</b>	• (EP)	• (ME)	–	0.94	9.3	S, M, H	•	Steel, alloyed steel, Al*	Multifunctional universal product for drilling, turning, milling and grinding of various alloys.  DMQP Product
<b>ECOCOOL S-FC IDM</b>	–	–	•	1.05	9.5	S, M	•	Steel, cast iron, Al*	Fully synthetic coolant for grinding and machining of cast iron, steel and conventional aluminium alloys.  DMG MORI Approval
<b>ECOCOOL AFC 1515 BW</b>	• (EP)	–	–	0.99	9.4	S, M	•	Steel, stainless steel, Al (critical for staining)	For the machining of steel materials and Al with low Si content and Al - materials critical for staining.  DMG MORI Approval

# 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 Aluminium</b>									
<b>ECOCOOL HPL 720 GT</b>	• (EP)	–	–	0.96	9.0	S, M, H	•	Steel alloyed steel, Al*	Multi-functional metalworking fluid, especially for difficult operations such as reaming and threading. GROB-Approval
<b>ECOCOOL ALUSTAR BF</b>	•	–	–	0.94	7.9	M	•	Steel, alloyed steel, Al*, zinc- and lead-containing nonferrous materials	High-quality, universal metalworking fluid, especially for machining of zinc- and lead-containing nonferrous materials and critical aluminium alloys; pH neutral; outstanding lubricity; good wetting and flushing properties
<b>ECOCOOL AFC 1515</b>	•	–	–	0.95	9.4	S, M, H	•	Steel alloyed steel, Al*	For roughing and precision machining, as well as the grinding of steel and aluminium materials; excellent lubricity; always maintain minimum concentration
<b>ECOCOOL R - 2030</b>	•	–	–	1.00	9.4	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-G2</b>	–	–	• (EP)	1.06	8.8	S, M	•	Steel, Al*	Fully-synthetic metalworking fluid for the most demanding machining and grinding operations on steel and aluminium alloys; extremely low foaming; suitable for soft water and high pressures; better economy due to low drag-out losses
<b>Machining Cast Iron and Low-Alloy Steels</b>									
<b>ECOCOOL FERROSTAR MBF</b>	–	• (ME EP)	–	0.97	9.6	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. GROB-Approval
<b>ECOCOOL 68 CF 3-1</b>	–	• (ME)	–	1.02	9.4	M, 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	9.7	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	9.5	M, H	–	Steel, cast iron	Metalworking fluid for general machining operations; low drag-out losses. DMG MORI Approval
<b>ECOCOOL VHCM - 1</b>	–	• (ME EP)	–	0.99	9.4	S, M	•	Steel, cast iron	Metalworking fluid for general machining and grinding operations; boron-free equivalent to ECOCOOL R -VHCM; low drag-out losses. Also available pre-preserved under ECOCOOL VHCM-1K.

## 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 High-Alloy Steels and Hot Strength Materials</b>									
ECOCOOL R - 2030	•	–	–	1.00	9.4	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
ECOCOOL TN 2530	• (EP)	–	–	0.98	9.4	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.
ECOCOOL AFC 1515	•	–	–	0.95	9.4	S, M, H	•	Steel alloyed steel, Al*	For roughing and precision machining, as well as the grinding of steel and aluminium materials; excellent lubricity
ECOCOOL FERROSTAR MBF	–	• (ME EP)	–	0.97	9.6	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. GROB-Approval
<b>Machining Nonferrous Metals (Copper, Brass, Bronze)</b>									
ECOCOOL ALUSTAR BF	•	–	–	0.94	7.9	M	•	Steel, alloyed steel, Al*, zinc- and lead-containing nonferrous materials	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>Machining Magnesium</b>									
ECOCOOL 2516 MG-DC	•	–	–	0.97	9.3	H	•	Al*, Mg	High-quality, universally applicable metalworking fluid; specially developed for the machining of magnesium; mixing water > 30 °dH; stable up to 200 °dH without deposits forming
<b>Special Products</b>									
ECOCOOL GS 2000	–	–	•	1.06	8-10	–	•	Cast iron, steel	Thread cutting medium for water pipes; approved by the German DVWG; dyed red
ECOCOOL S CO 5 BF	–	–	•	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
ECOCOOL S-240	–	–	•	1.00	9.0	S, M	•	Composites	Fully-synthetic metalworking fluid for machining CFRP/GFRP, good wetting and flushing properties, extreme less foaming, leaves no sticky residues

# 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 7854 PLUS</b>	EP top-up concentrate	0.5 - 2	–	–	Increases EP performance. Not for machining nonferrous metals and fully-synthetic products
<b>ECOCOOL ALKALISATOR G</b>	Primary alkanolamine	0.1 - 0.5 steps	(•)	•	Increases pH value
<b>ECOCOOL AKTIV CU</b>	Copper deactivator	0.2 - 3	•	–	Combats the staining and greenish discolouration of nonferrous metals
<b>ECOCOOL AKTIV ALU</b>	Against aluminium 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 synthetic solutions
<b>ANTIFOAM 46 W</b>	Si-organic compound	0.001 - 0.01 (of the emulsion volume)	–	–	Equivalent to ANTIFOAM 46 but with solubilizers, 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 solubilizers, 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) [%]	Fungicide	Bactericide	pH value effect	Main application area
<b>Formaldehyde-free Bactericides and Fungicides for the Maintenance of ECOCOL Water-miscible Metalworking Fluids</b>					
<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
<b>ACTICIDE M 20</b>	0.1 - 0.2	•	•	–	Fungicide and bactericide for emulsions, chloride-free, AOX-free
<b>ACTICIDE MV</b>	0.1 - 0.2	–	•	–	Fast working 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 and 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

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 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 definite 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 KE	18	0.89	196	•	•	–	(•)	
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 8536 S	37	0.95	200	•	•	–	–	

## ECOCUT, PLANTO

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. 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	•	•	–	–	

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 MIKRO 40 SR	40	0.92	216	•	•	•	–	Rapidly biodegradable minimum quantity lubrication oil, ester-based, universally applicable for all materials. Low evaporation and low misting; can be used with diverse application systems.
PLANTO MIKRO UNI	15	0.88	200	•	•	•	•	Rapidly biodegradable, ester-based, high EP level minimum quantity lubrication oil, universally applicable for all materials. Suitable for all spray systems.
PLANTO MIKRO 30 HD	30	0.93	211	•	•	•	–	Minimal quantity lubrication oil based on ester, with high EP level. Applicable for steel, steel alloys and aluminium alloys. Can be used with diverse spray systems.
ECOCUT MIKRO 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 MIKRO PLUS 82	20	0.84	172	•	•	•	•	

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
<b>Specific Application – Tool grinding</b>						
ECOCUT FT 7 WSE	8.0	0.81	184	•	(•)	Grinding oil based on GTL oil, applicable for the grinding and sharpening of HSS and tungsten carbide tools; low aromatic content; combats cobalt solubility; suitable for micro-filtering systems
ECOCUT HS	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

## Neat Cutting Fluids

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 Application – Gear Machining</b>								
ECOCUT 628 LE	26	0.86	210	•	•	–	–	Universally applicable for all gear machining operations (shaving, hobbing, shaping, etc)
ECOCUT 720 LE	21	0.89	210	•	•	–	–	
ECOCUT HFN 13 LE UNI	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 free version as ECOCUT HFN 13 LE CLP
ECOCUT HSG 211 LE	11	0.84	172	•	•	•	•	High-performance grinding oil for gear grinding. Approved by the leading grinding machine manufacturers. Low misting and low evaporation
<b>Specific Application – Spark Erosion</b>								
ECOCUT FE	4	0.81	134	•	•	•	•	Dielectric medium, especially for roughing; free of aromatics
ECOCUT 1520	2,3	0.82	101	•	•	•	•	Dielectric, can be used for roughing as well as for finishing. Despite lower viscosity high flash point >100 °C
<b>Specific Application – Threading</b>								
ECOCUT 522	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
<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 applications – Medical Technology</b>								
PLANTOCUT 10 SR	10	0.86	206	•	•	•	•	Rapidly biodegradable, ester-based cutting oil. Recommended turning, milling, drilling, etc. Low evaporation and low misting; H304-free.
ECOCUT 7520 LE-M	17	0.86	214	•	•	•	•	High performance machining oil for the machining of high-alloy, difficult-to-cut materials used in medical technology.

## 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 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 EK	18	0.89	196	•	•	–	(•)	
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

Quenching Oils based on Mineral Oil	90
High-performance Quenching Oils based on Mineral Oil	90
High-performance Quenching Oils based on Hydrocrack Oil	90
Synthetic High-performance Quenching Oils	90
Water-miscible Quenchants	91

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## Quenching Fluids

Product name	Kin. Visc. at 40 °C [mm <sup>2</sup> /s]	Density at 15 °C [g/ml]	Flash-point [°C]	Temperature range bath temperature [°C]	Main application area
<b>Quenching Oils based on Mineral Oil</b>					
<b>THERMISOL QB 32</b>	31	0.87	231	50 – 90	Quenching oils based on mineral oil are usually conventional solvates containing a relatively low level of additives. These oils are generally used to quench components made of high-alloy materials and with simple geometries. They are mainly used for the heat treatment of distortion-resistant components.
<b>THERMISOL QB 46</b>	46	0.87	220	50 – 100	
<b>High-performance Quenching Oils based on Mineral Oil</b>					
<b>THERMISOL QH 10</b>	12	0.85	178	50 – 80	High performance quenching oils usually contain high levels of additives and special agents which accelerate component wetting. High performance quenching oils are normally based on conventional solvates. They are widely used because optimized wetting behaviour makes them suitable for warp-prone components. Depending on the flash point, these quenching oils can also be used as hot bath and martempering oils.
<b>THERMISOL QH 40</b>	45	0.87	234	50 – 110 (max. 150)	
<b>THERMISOL QH 120</b>	119	0.89	256	50 – 170 (max. 200)	
<b>THERMISOL QWA 460</b>	503	0.90	328	100 – 180 (max. 275)	
<b>High-performance Quenching Oils based on Hydrocrack Oil</b>					
<b>THERMISOL QH 10 MC</b>	11	0.84	172	50 – 80	High performance quenchants based on high-quality, low evaporation and low-aromatic hydrocracked oils. MC - the key is a special manufacturing process in which natural mineral oil is converted by hydrocracking, i.e. under high pressure and high temperatures in the presence of H <sub>2</sub> (hydrogen). This creates a more cost-effective base oil which is comparable to synthetic oils. This base oil together with high-quality additives combines the oxidation stability and the optimum wetting properties of high-performance quenching oils with the thermal stability and extremely low evaporation of hydrocracked oils. The new development THERMISOL QH 35 MC is a universal high-performance quenching oil with best performance values and high process reliability.
<b>THERMISOL QH 30 MC</b>	26	0.84	220	50 – 100 (max. 150)	
<b>THERMISOL QH 35 MC</b>	37	0.85	236	40 – 100 (max. 150)	
<b>Synthetic High-performance Quenching Oils</b>					
<b>THERMISOL QHY 10</b>	11	0.87	204	50 – 130	The use of these quenching oils based on synthetic esters is particularly recommended for highly warp-prone components. Apart from their sustainability credentials, these high-performance quenching oils offer a number of other advantages. Synthetic high-performance quenching oils have significantly better wetting properties than their conventional counterparts. These excellent wetting properties ensure that the vapour phase over the whole surface of the component being treated collapses rapidly. This almost simultaneous wetting of the entire component surface significantly reduces the temperature gradients created during quenching and thus ultimately the uneven shape changes known as warping. Depending on the flash point, these quenching oils can also be used as hot bath and martempering oils.
<b>THERMISOL QHY 35</b>	36	0.93	226	60 – 270	
<b>THERMISOL QHY 150</b>	145	0.93	312	60 – 260	

# THERMISOL

Product name	Main application	Quenching performance	Materials	Properties
<b>Water-miscible Quenchants</b>				
<b>THERMISOL PGI 2010</b>	Quenching for induction and flame hardening	Very high	Unalloyed ferrous material	The quenching performance of the water is not reduced. Especially for high corrosion protection requirements.
<b>THERMISOL QZS 700 K-FF</b>	Quenching for induction and flame hardening	Very high	Unalloyed ferrous material Low-alloyed ferrous material	Contains no biocides and offers a particularly good dissolving capacity. Especially for high corrosion protection requirements.
<b>THERMISOL QZS 400 WB</b>	Quenching for induction and flame hardening	Very high	Unalloyed ferrous material Low-alloyed ferrous material	Offers a particularly good dissolving capacity. Long service life can be achieved. Especially for high corrosion protection requirements.
<b>THERMISOL QZS 300 ALU</b>	Quenching for induction and flame hardening	Very high	Aluminium alloy Low-alloyed ferrous material Unalloyed ferrous material	Especially suitable for the heat treatment of aluminium. Meets the requirements of SAE AMS 3025 C (paragraph 3.2).
<b>THERMISOL QZS 150 MM</b>	Bath quenching of batches	High	Unalloyed ferrous material Low-alloyed ferrous material High-alloyed ferrous material	Mild quenching characteristics can be achieved. Can be used as a substitute for low viscosity hardening oils.
<b>THERMISOL QZS 550</b>	Bath quenching of batches	Medium	Unalloyed ferrous material Low-alloyed ferrous material High-alloyed ferrous material	Particularly mild quenching characteristics can be achieved. Can be used as a substitute for higher viscosity hardening oils.
<b>THERMISOL QZS 550 CPO</b>	Bath quenching of batches	High	Unalloyed ferrous material Low-alloyed ferrous material High-alloyed ferrous material	Mild quenching characteristics can be achieved. Can be used as a substitute for low viscosity hardening oils. Especially for high corrosion protection requirements.

## Properties water-miscible quenching fluids THERMISOL series

General characteristics	QZS 300, 400 and 700 series	QZS 150 and 550 series
<ul style="list-style-type: none"> <li>▪ Reduces the quenching intensity of water (QZS series)</li> <li>▪ Free from biocides and bactericides</li> <li>▪ Formaldehyde-free</li> <li>▪ Very low fire hazard</li> <li>▪ No oil vapour is released</li> </ul>	<ul style="list-style-type: none"> <li>▪ High cooling rate</li> <li>▪ Hardly any reduction of the cooling rate in the martensite-transforming temperature range</li> <li>▪ Smooth collapse of the polymer film</li> <li>▪ Especially recommended for spraying or dipping after inductive heat treatment or flame hardening</li> </ul>	<ul style="list-style-type: none"> <li>▪ Oil-like quenching characteristics</li> <li>▪ Low cooling rate in the martensite-transforming temperature range</li> <li>▪ Coarse, uneven collapse of the polymer film</li> <li>▪ Very different quenching intensities adjustable via concentration</li> <li>▪ Quenching of high-alloyed materials up to tool steel possible</li> <li>▪ Particularly recommended for large and crack-sensitive components</li> </ul>

# 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	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Neutral Cleaner</b>									
<b>RENOCLEAN MSO 3011</b>	Neutral cleaner for spray and high-pressure cleaning, high-pressure deburring	Highly demulsifying, almost foam-free above 25 °C, salt-free. Boron-free new development for RENOCLEAN VR 1021 DGI!	Fe, Al, Cu, Ms	Temporarily, '2% / in DI-water	9.2 ± 0.4 at 3.5%	3 (1 - 5)	50 (20 - 80)	600	1036 ± 15
<b>RENOCLEAN WSA 3002</b>	Spray cleaner for high-pressure cleaning and high-pressure deburring systems	Practically foam-free from 30 °C  VW-release A29 2862 as RENOCLEAN VR 1021 C!	Fe, Al, Cu, Ms, Plastics <sup>1</sup>	Temporarily, '2.5% / 10 °dH	9.2 ± 0.4	2 (1 - 5)	65 (30 - 80)	30 (High pr. device 350)	1082 ± 15
<b>RENOCLEAN MTO 3002</b>	Neutral cleaner and corrosion protection "All-in-One" for spray, pressure flood, high pressure cleaning and deburring	Very low residue formation, very good temporary corrosion protection, low-foaming application from 20 °C pressure-dependent, salt-free	Fe, Cu, Ms, (Al, Mg) <sup>1</sup>	Temporarily, '2% / 10 °dH	9.4 ± 0.5	3 (2 - 5)	60 (20 - 80)	500 (≥ 50 °C)	1078 ± 20
<b>RENOCLEAN MTO 3001</b>	Multi-metal capable neutral cleaner for spray and immersion applications	Suitable for ultrasonic, universal use, e.g. before heat treatment, sprayable from ~ 45 °C, very low residue formation, salt-free	Fe, Al, red brass, (Zn, Cu, Ms, Plastics) <sup>1</sup>	Temporarily, '2% / in DI water	9.5 ± 0.4	2.5 (1 - 7)	60 (30 - 80)	15	1035 ± 15
<b>RENOCLEAN MTO 3003</b>	Multi-metal capable neutral cleaner for spray and immersion applications	Developed especially for the removal of micro-quantity lubricants such as: ECO-CUT MIKRO PLUS 20. almost foam-free from 30 °C, salt-free.	Fe, Al, Zn, Cu, Ms, Plastics <sup>1</sup>	Temporarily, '2% / in DI water	9.5 ± 0.4	3 (2 - 7)	60 (30 - 80)	300 (500 short-term)	1050 ± 15
<b>RENOCLEAN MSO 3004</b>	Neutral cleaner for spray and high-pressure cleaning up to 500 bar	Residue formation very low, suitable for microfiltration, can be used before heat treatment, almost foam-free from 10 °C, salt-free	Fe, Al, Zn, Cu, Ms, Mg <sup>1</sup>	Temporarily, '2% / in DI water	9.8 ± 0.4	2.5 (1 - 5)	60 (10 - 80)	500 (≥ 50 °C)	1038 ± 15
<b>RENOCLEAN MSA 3011</b>	Neutral cleaner for spray, pressure flooding, high pressure cleaning and deburring	Foam-free from 20 °C, pressure and temperature dependent  PSA approval worldwide: MABEC-code Z 000 533 700	Fe, Al, Cu, Ms, Mg	Temporarily, '2.5 % / 10 °dH	9.8 ± 0.4	3 (1 - 5)	60 (20 - 80)	500 (≥ 50 °C)	1040 ± 15

# RENOCLEAN

Product name	Function	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Neutral Cleaner</b>									
<b>RENOCLEAN VR 1021 CXV</b>	Spray cleaner for spray, pressure flood and high pressure cleaning up to approx. 300 bar	High pressure cleaning (200 bar, 300 for short periods), almost foam-free from 30 °C  VW-Approval A29 0976	Fe, Al, Brass, Cu, Mg	Temporarily, '2% / 10 °dH	9.8 ± 0.3	3 (1 - 5)	65 (30 - 80)	200 (300 short-term)	1053 ± 15
<b>RENOCLEAN VR 1021</b>	Neutral cleaner for spray application	Residue formation very low, usable before heat treatment, salt-free	Fe, Mg, (Al, Cu, Ms) <sup>1</sup>	Temporarily, '2% / 10 °dH	10.2 ± 0.3	2 (1 - 5)	65 (30 - 80)	20	1040 ± 15
<b>RENOCLEAN C 20 K 1427</b>	Neutral cleaner with very good corrosion protection for ferrous metals, spray application	Low residue formation, usable before heat treatment, salt-free  VW-Approval A29 2863	Fe, Mg <sup>1</sup>	Temporarily, '1.5% / 10 °dH	10.2 ± 0.4	2 (1 - 5)	65 (40 - 80)	15	1044 ± 15

# Cleaner

Product name	Function	Comments	Ma-terials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concen-tration range in %	Tem-perature range in °C	Spray 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	Spray cleaner for battery components	Fe	Temporarily, '2% / 10 °dH	9.9 ± 0.5 in 10 ° DIN water	2 (1 - 4)	60 (30 - 80)	20	1060 ± 15
<b>RENOCLEAN MTA 3003</b>	Multimetal capable spray and immersion cleaner, suitable for ultra-sonic cleaning	Universally applicable, e.g. for non-cutting formed parts or for engine reconditioning	Fe, Al, (Zn, Cu, Ms, Pla-stics) <sup>1</sup>	Temporarily, '3% / 10 °dH	9.7 ± 0.4 (3%)	3 (2 - 7)	65 (40 - 80)	15	1120 ± 15
<b>RENOCLEAN MSA 3001</b>	Multimetal capable spray cleaner	Universally applicable, limited suitability for immersion, low-foaming from approx. 40 °C	Fe, Al, Cu, Ms, (Zn, Pla-stics) <sup>1</sup>	Temporarily, '2.5% / 10 °dH	9.7 ± 0.4 (3%)	3 (2 - 7)	60 (40 - 80)	15	1074 ± 15
<b>RENOCLEAN MDA 4201</b>	Multimetal capable emul-sifying cleaner for immersion, ultrasonic and manual use  (ex RENOCLEAN VR 1798/2)	Alkaline silicate con-taining cleaner with very good wetting capacity, supports clean, spotless drying, also suitable for manual and floor cleaning from 20 °C	Fe, Al, Cu, Ms, (Zn, Pla-stics) <sup>1</sup>	–	10.7 ± 0.5	4 (2 - 7)	65 (20 - 80)	–	1058 ± 20
<b>RENOCLEAN WSA 4002</b>	Cleaner for spray, immer-sion, ultrasonic and manual application	For heavily soiled parts and aggregates (e.g. railway, engine and chassis parts)	Fe, Al, Cu, Ms, (Zn, Mg, Pla-stics) <sup>1</sup>	Temporarily, '2.5% / 20 °dH	12.0 ± 0.5 (2.5%)	3 (2 - 7)	60 (30 - 80)	15	1092 ± 15
<b>RENOCLEAN FDC 4001</b>	Cleaner for immersion, ultrasonic and manual applica-tion in medical technology	Supports stain-free drying. Can be com-bined with RENOCLEAN MDT 3002, silicate-free. Non-skin irritating.	Titan, Fe, Al, (Cu, Ms, Mg, Pla-stics) <sup>1</sup>	–	12.1 ± 0.5	5 (2 - 33)	65 (20 - 80)	–	1090 ± 15
<b>RENOCLEAN MDA 4002</b>	Immersion and ultrasonic cleaner, spray-able	For cleaning of parts, e.g.: with difficult to remove forming lubri-cants. Sprayable up to approx. 8 bar (depen-ding on the equipment)	Fe, Zn, Mg, (Al, Cu, Ms) <sup>1</sup>	Temporarily, '2.5 % / 20 °dH	12.2 ± 0.3	4 (1 - 7)	65 (40 - 80)	8	1145 ± 15
<b>RENOCLEAN FSA 4017</b>	Alkaline spray cleaner for fer-rous metals	For cleaning of parts, e.g.: with difficult to remove pigment dirt. Sprayable up to approx. 25 bar (depending on the plant)	Fe	Temporarily, '2 % / 20 °dH	12.3 ± 0.5	3 (1 - 7)	65 (35 - 85)	25	1168 ± 15
<b>RENOCLEAN VR 2999</b>	Spray and im-mer-sion cleaner for ferrous metals, suitable for ultrasonic	For cleaning of parts, e.g.: with difficult to remove pigment dirt (e.g. deep-drawn formed parts)	Fe	Temporarily, '2% / 10 °dH	12.3 ± 0.6	3 (2 - 7)	60 (40 - 80)	10	1175 ± 15

# RENOCLEAN

Product name	Function	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH or flash point in °C	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
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## Acid Cleaner

<b>RENOCLEAN FTM 1001</b>	Derusting, decalcification phosphoric acid for immersion, ultrasonic and manual application	Suitable for cleaning calcified and germinated cleaning systems. Integrated consumption indicator	Fe, Al, Mg, Plastics) <sup>1</sup>	Ferrous parts must be metallicly bright after treatment and immediately protected with corrosion protection (RENOCLEAN or ANTICORIT product)	1.5 ± 0.5 in DI-water	10 (5 - 50)	30 (20 - 60)	5	1360 ± 15
<b>RENOCLEAN FSO 2010</b>	Neutral deruster for spraying, immersion and ultrasonic applications	Chloride free, applicable after thermal or ECM deburring	Fe, Al, (Cu, Ms, Mg, Plastics) <sup>1</sup>		5.9 ± 0.5 at 5%	10 (2 - 30)	50 (20 - 70)	20 (HD 200)	1265 ± 20

Product name	Function	Comments	Materials	Flash point in °C	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
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## Assembly Aids

<b>RENOCLEAN 431</b>	Industrial assembly aid for rubber and elastomers	Lubricant, for example, for fitting window seals made of rubber, hoses, etc. Parts are fixed after drying, no more sliding effect	–	–	7 ± 1 (100%)	20 (10 - 30)	Room temperature (15 - 30)	–	1017 ± 15
<b>RENOCLEAN GXS 9055</b>	Assembly aids, ready for use, synthetic (ex PENTOSIN MONTAGE-FLUID 55)	Aid for the assembly of various components. Compatible with all common lubricants and corrosion protection agents based on mineral, HC synthetic or synthetic oil as well as fuels	–	≥ 134	–	100	Room temperature (15 - 30)	–	897 ± 10
<b>RENOCLEAN GXS 9067</b>	Assembly aid, ready for use, UV additive (ex PENTOSIN MONTAGE-FLUID 67UVA)	Aids for assembly and short-term transport of brake units and their components. Compatible with all common brake fluids, contains UV indicator.	–	≥ 200	–	100	Room temperature (15 - 30)	–	992 ± 10
<b>RENOCLEAN GXS 9094</b>	Assembly aid, containing corrosion protection, synthetic (ex PENTOSIN MONTAGE-FLUID 94)	Aids for assembly and short-term transport of brake components and brake systems. Compatible with all common brake fluids	–	≥ 210	–	100	Room temperature (15 - 30)	–	995 ± 10

# Cleaner

Product name	Function	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Special Products</b>									
<b>RENOCLEAN GSO 3001</b>	Cleaner for transport containers (KLT) for spray, immersion and manual application	For removing oil, grease, abrasion and transport dust. Designed for container cleaning systems	All materials <sup>1</sup>	–	8.5 ± 0.5 (100%)	2 (1 - 10)	50 (20 - 80)	5	1004 ± 15
<b>RENOCLEAN GTM 3001</b>	Drying accelerator for spraying and immersion application	Antistatic effect on plastic surfaces. Dosage in rinse tank e. g. for faster drying of plastic containers	–	–	8.7 ± 1	0.3 (0.2 - 1.0)	50 (20 - 80)	5	1017 ± 15
<b>RENOCLEAN FXM 3014</b>	Synthetic weld release agent with corrosion protection	Ready to use solution! Forms a coherent moist film that prevents the adhesion of welding beads	–	Temporarily, '100%	8.7 ± 0.5 (100%)	100	Room temperature (15 - 30)	–	1010 ± 15
<b>RENOCLEAN GXM 3001</b>	Defoamer, foam regulating additive especially for cleaning solutions	Immediate, long-lasting defoaming and deaerating effect	–	–	8.8 ± 1.2 (100%)	0.05 (0.01 - 0.25)	–	–	998 ± 15
<b>RENOCLEAN MXO 3001</b>	Vibratory finishing compound with synth. corrosion protection, mildly alkaline cleaner for immersion application	Suitable for all ferrous metals, after testing also for aluminium, zinc and magnesium materials	–	Temporarily, '5% / in DI-water	8.8 ± 0.5 (5 %)	2 (2 - 5)	20 (20 - 80)	–	1029 ± 15
<b>RENOCLEAN MXO 3003</b>	Designed as a transmission medium for ultrasonic crack detection.	Biocide-containing, synthetic corrosion protection product free of mineral oil and surfactants	Fe, Al, Cu, brass	Temporary '3% / in DIN-water	9.2 ± 0.5 (3 %)	4 (1 - 10)	30 (10 - 70)	100	1081 ± 15
<b>RENOCLEAN GXA 3004</b>	Floor, plant and hall cleaners	For all manual and mechanical applications, odourless, especially suitable for floor cleaning equipment	All materials <sup>1</sup>	–	9.1 ± 0.6 (100%)	3 (1 - 20)	20 (20 - 90)	–	1047 ± 15
<b>RENOCLEAN AKTIV DA</b>	Demulsifier for separating emulsified oil	Demulsifier with defoaming effect, equipment for removing demulsified oil is necessary (oil separator etc.)	–	–	9.3 ± 0.7 (100%)	0.2 (0.05 - 1.0)	–	–	987 ± 10

# RENOCLEAN

Product name	Function	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
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## Special Products

<b>RENOCLEAN SPEZIAL 2000</b>	Emulsifying universal cleaner for immersion, ultrasonic and manual cleaning of commercial vehicles, tarpaulins, halls and workshops	For all manual cleaning, for immersion, suitable for steam jet and floor cleaning equipment. Specifications - FORD Tox-Number 150602 (2014) - Federal-Mogul Nürnberg GmbH, Release number R041 (2014)	Fe, Mg, (Al, Cu, Ms, Lacke, Plastics) <sup>1</sup>	–	10.9 ± 0.4 at 3%	5 (1 - 20)	35 (20 - 80)	–	1045 ± 20
<b>RENOCLEAN GXA 4014</b>	Universal cleaner for floors, halls and vehicle fleet	For mechanical and manual cleaning of workshop, vehicle fleet, etc. Contains lime scent	Fe, Mg, (Al, Cu, Ms, Lacke, Plastics) <sup>1</sup>	–	11.7 ± 0.5 (1%)	3 (1 - 20)	20 (20 - 80)	–	1036 ± 15

# Cleaner

Product name	Function	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray 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	Borate, silicate and surfactant free, micro-filterable, *	Al, Cu, Ms, Plastics, Zn <sup>1</sup>	–	7.7 ± 0.8	4 (2 - 8)	65 (20 - 80)	Applicable spraying pressure according to the surfactant component used!	1335 ± 25
<b>RENOCLEAN MTA 4001</b>	Builder, medium alkaline, for immersion, pressure flood, flood and spray application	Borate, silicate and surfactant free, micro-filterable, *	Fe, Plastics, (Al, Zn, Cu, Ms, Mg) <sup>1</sup>	–	10.0 ± 0.6	4 (2 - 8)	65 (20 - 80)		1579 ± 25
<b>RENOCLEAN FTA 4002</b>	Builder, highly alkaline, for dipping, pressure flooding, flooding and spraying	Borate, silicate and surfactant free, micro-filterable, *	Fe, Mg, Plastics <sup>1</sup>	–	12.5 ± 0.5	4 (2 - 8)	65 (20 - 80)		1435 ± 20
<b>RENOCLEAN ENTFETTER 39</b>	Builder, highly alkaline, silicate, for dipping, pressure flooding, flooding and spraying	Borate-free	Fe, Mg, Al, Cu, brass, plastic, Zn <sup>1</sup>	–	12.8 ± 0.6	5 (1 - 20)	65 (20 - 80)		1410 ± 20
<b>RENOCLEAN FTA 4001</b>	Builder, highly alkaline, for immersion, pressure flooding, ultrasonic and spray cleaning, electrolytic degreasing, dephosphating	Borate-free, micro-filterable, *	Fe, Mg, (Cu, Ms, Plastics) <sup>1</sup>	–	12.9 ± 0.6 (1 %)	5 (2 - 20)	65 (20 - 85)		1433 ± 25
<b>RENOCLEAN VR 3222</b>	Builder with corrosion protection, recyclable, for immersion, pressure flood, flood and spray application	Free of nitrite, borate, silicate and surfactants, micro-filterable, suitable for high pressure, free of salt, *	All materials <sup>1</sup>	Temporarily, '3.5% / 10 °dH	8.0 ± 0.4 (3.5%)	2 (0.5 - 5)	60 (20 - 80)		1079 ± 15
<b>RENOCLEAN VR 2729 K</b>	Builder with corrosion protection, recyclable, salt-free, for immersion, pressure flood, flood and spray application	Free of nitrite, borate, silicate and surfactants, micro-filterable, *. Has a corrosion-protecting effect in the vapour phase. Salt-free.	Fe, Mg, Plastics <sup>1</sup>	Temporarily, '3% / 10 °dH	10.8 ± 0.5 (3 %)	2 (0.5 - 5)	60 (20 - 80)		1035 ± 15

Fe – steel, iron, cast iron and stainless steel

1 – to check first

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

# RENOCLEAN

Product name	Function	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray 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 flood, ultrasonic and spray cleaning	Micro-filterable, strongly dependent on membrane and working parameters! Spraying at least 50 °C	All materials <sup>1</sup>	–	5.5 ± 1.5	1 (0.3 - 5)	65 (20 - 80)	10 (15 above 65 °C)	1027 ± 15
<b>RENOCLEAN MTT 2003</b>	Cleaning booster for immersion, pressure flood, ultrasonic and spray cleaning	Micro-filterable, strongly dependent on membrane and working parameters! Spraying at least 40 °C	All materials <sup>1</sup>	–	7.9 ± 1.2 (1%)	1 (0.4 - 5)	65 (20 - 80)	15 (25 above 65 °C)	1020 ± 20
<b>RENOCLEAN TENSID 161</b>	Cleaning booster for immersion, ultrasonic and pressure flood cleaning	Micro-filterable, strongly dependent on membrane and working parameters! *	All materials <sup>1</sup>	–	9.1 ± 0.6	0.4 (0.1 - 1)	65 (20 - 80)	2 (above 60 °C)	1025 ± 20
<b>RENOCLEAN VR 1500</b>	Cleaning booster for spray cleaning, neutral cleaner	As a neutral cleaner free from corrosion protection components	All materials <sup>1</sup>	–	8.5 ± 0.5	1 (0.3 - 5)	65 (30 - 80)	25	1047 ± 15
<b>RENOCLEAN MDT 3002</b>	Cleaning booster, emulsifying, for immersion, ultrasonic and pressure flood cleaning	Good ultrasonic support, high oil and grease absorption	All materials <sup>1</sup>	–	9.8 ± 1.0 (3 %)	1 (0.3 - 2)	65 (20 - 80)	0.5	1050 ± 20

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	Materials	Corrosion protection, chip/ filter test 0/0 at x% in y °dH	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	According to coolant	–	app. 9 ± 1 at 1%	2 (1 - 3)	1010 ± 15
<b>RENOCLEAN SMC+</b>	System Cleaner complete product for coolant supply systems, contains no formaldehyde separators	Contact time 8 - 24h Schaeffler, approval for all plants world-wide	According to coolant	–	10.4 ± 0.4	1.5 (1 - 2)	1016 ± 15
<b>RENOCLEAN FXM 4005</b>	System cleaner biocide- and fungicide-free, for coolant supply systems, basic system without biocide / fungicide	Contact time 8 - 24h Separate dosing of bactericide. Permanent use in coolant lubricants without bactericide possible	According to coolant	–	10.0 ± 0.6	1.5 (1 - 2)	1005 ± 15
<b>ACTICIDE MBS / WB 200</b>	Biocides and fungicides for system cleaning, in combination with RENOCLEAN FXM 4005 for targeted application	See "Service additives for cooling lubricants" under "Cooling lubricants - water-miscible"	According to contamination / infestation	–	–	–	–

# RENOCLEAN

Product name	Function	Comments	Ma- terials	Evapora- tion number approx. Ether = 1	Flash point in °C	Boiling range in °C	Density at 15 °C in kg/m <sup>3</sup>
<b>Solvents</b>							
<b>RENOCLEAN MTS 7001</b>	Cleaner based on modified alcohols	Distillable. Especially designed for closed cleaning systems!	All ma- terials, plastics <sup>1</sup>	125	≥ 61	165 - 175	880 ± 10
<b>RENOCLEAN MVS 8015</b>	Hydrocarbon cleaner based on isoparaffin, aromatic-free	Narrow boiling cut, fast drying, distillable. Especially designed for closed cleaning systems!		93	≥ 56	179 - 197	760 ± 10
<b>RENOCLEAN MVS 8016</b>	Hydrocarbon cleaner based on isoparaffin, aromatic-free	Narrow boiling cut, fast drying, distillable. Especially designed for closed cleaning systems!		115	≥ 62	184 - 206	763 ± 10
<b>RENOCLEAN MVS 9004</b>	VOC-compliant, aromatics-free hydrocarbon cleaner  (ex RENOCLEAN KLV)	Universal application, slowly evaporating. Simple application, e.g. for the removal of car wax preservative. VW-Approval A29 2819		900	≥ 86	217 - 255	810 ± 20
<b>RENOCLEAN MVS 9014</b>	VOC- and aromatic-free hydrocarbon cleaner with corrosion protection	VOC compliant. Universal application, good corrosion protection due to very thin oil film. For solvent plants without distillation		900	≥ 86	217 - 255	814 ± 20
<b>FUCHS MULTICLEAN</b>	Low-aromatic hydrocarbon cleaner, environmentally friendly, demulsifying	Universal application in industry and trade, applicable with steam jet, good corrosion protection properties. Free of corrosive and caustic substances		120	≥ 61	180 - 330	795 ± 15
<b>RENOCLEAN MVS 8010</b>	Hydrocarbon cleaner based on isoparaffin, aromatic-free  (ex RENOCLEAN KU)	Gentle cleaning, for precision mechanics and electronic parts cleaning, not irritating to skin. Easy application, for solvent plants without permanent distillation		123	≥ 61	180 - 220	766 ± 10
<b>RENOCLEAN MVS 7008</b>	Hydrocarbon cleaner, aromatics-free  (ex RENOCLEAN KAF)	Fine cleaning, fast drying. Easy application, for solvent plants without permanent distillation		200	≥ 61	160 – 245	790 ± 25
<b>RENOCLEAN ECO AIR</b>	Washing oil for air purification devices  (ex RENOCLEAN MVS 9005 / PENTOWASH 30!)	Washing oil for air cleaning systems in aluminium rolling mills, distillable, recyclable		–	≥ 220	–	837 ± 20

## Cleaner

Product name	Function	Comments	Materials	Corrosion protection, chip/filter test 0/0 at x% in y °dH	pH (2%), if applicable	Concentration range in %	Temperature range in °C	Spray pressure in bar to app.	Density at 15 °C in kg/m <sup>3</sup>
<b>Corrosion Protection</b>									
<b>RENOCLEAN VR 3222</b>	Synthetic, mineral oil-free corrosion protection	Nitrite- and borate free, suitable for vibratory grinding. For dipping, flooding, pressure flooding and spray application.	All materials <sup>1</sup>	Temporarily, '3.5% / 10 °dH	8.0 ± 0.4 (3.5%)	2 (0.5 - 5)	60 (20 - 80)	100	1079 ± 15
<b>RENOCLEAN MTO 3002</b>	Corrosion protection and neutral cleaner "All-in-One" for spray, pressure flood and high pressure application	Very low residue formation, very good temporary corrosion protection, low-foaming application from 20 °C, pressure dependent	All materials <sup>1</sup>	Temporarily, '2% / 10 °dH	9.4 ± 0.4	3 (2 - 5)	60 (20 - 80)	500 at 50 °C	1090 ± 15
<b>ANTICORIT SKR 40</b>	Synthetic hydraulic water and corrosion protection concentrate	Immersion and filling application, especially for press water applications. Not approved for drinking water!	Fe	Temporarily, '4% / 20 °dH	9.4 ± 0.3 (10%)	7 (3 - 10)	20 (10 - 40)	10	1038 ± 15
<b>ANTICORIT SKR 42</b>	Synthetic hydraulic water and corrosion protection concentrate	Stable against salt and alkali entrainment, for immersion and filling applications	Fe	Temporarily, '1.5% / 20 °dH	9.8 ± 1	3 (1 - 5)	20 (10 - 50)	10	1068 ± 15
<b>ANTICORIT SKR 3001</b>	Synthetic, mineral oil-free corrosion protection	Free of nitrite and borate, protects in the vapour phase against corrosion, suitable for vibratory grinding, for immersion, pressure flood, flood and spray applications	All materials <sup>1</sup>	Temporarily, '2% / 20 °dH	9.8 ± 0.4	3 (0.5 - 5)	60 (10 - 80)	2	1033 ± 15
<b>RENOCLEAN VR 2729 K</b>	Synthetic, mineral oil-free corrosion protection	Free of nitrite and borate, protects in the vapour phase against corrosion, suitable for vibratory grinding, for immersion, pressure flood, flood and spray applications	Fe	Temporarily, '1.5% / VE	10.8 ± 0.5 (3%)	2 (0.5 - 5)	60 (20 - 80)	300	1035 ± 15
<b>RENOCLEAN MTE 3001</b>	Emulsion cleaner, water miscible corrosion protection concentrate	Emulsion cleaner and corrosion protection emulsion for immersion, flush and spray application. Free of barium and boron compounds, contains no monoethanolamine	All materials <sup>1</sup>	Temporarily, '3% / 10 °dH	8.8 ± 0.5	4 (3 - 20)	20 (20 - 60)	5	995 ± 20

# RENOCLEAN

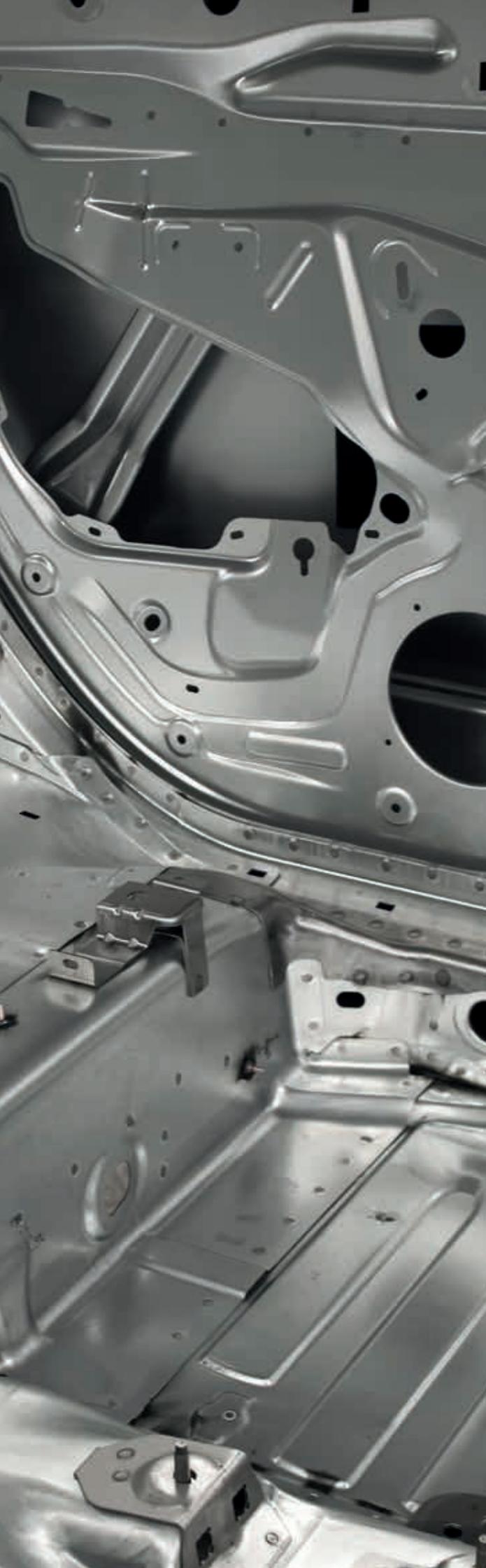
Product name	Function	Application	Comments	Available packaging units	Accessories
<b>Skin Protection Prior to Work</b>					
<b>RENOCLEAN HAND PROTECT MULTI</b>	Silicone-free, fingerprint-free, breathable and universally applicable skin protection cream	Before working with alternating substances (water-soluble and water-insoluble contaminants and irritants)	Forms a thin, invisible and protective film on the skin	20 * 100 ml tube 6 * 1000 ml pouch bottle	RENOCLEAN DONA 2000K Dispenser (for pouch bottle, 1000ml and 2000ml)
<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	25 * 250 ml bottle 6 * 2000 ml pouch bottle	RENOCLEAN DONA 2000K Dispenser (for pouch bottle, 1000ml and 2000ml)
<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	25 * 250 ml bottle 6 * 2000 ml pouch bottle	RENOCLEAN DONA 2000K Dispenser (for pouch bottle, 1000ml and 2000ml)
<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	20 * 100 ml tube 6 * 1000 ml pouch bottle	RENOCLEAN DONA 2000K Dispenser (for pouch bottle, 1000ml and 2000ml)

# CORROSION PREVENTIVES

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.



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## Corrosion Preventives

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	0.002	2	2-4	4-8	146	–	–	–
<b>ANTICORIT RPO 2001</b>	Conventional corrosion protection oil with medium viscosity	15	839	0.005	4	2-4	4-8	194	–	–	–
<b>ANTICORIT RPO 2002</b>	Conventional corrosion protection oil with medium viscosity; improved corrosion protection	15	846	0.005	4	3-5	5-8	190	–	–	–
<b>ANTICORIT RPO 3002</b>	Conventional corrosion protection oil with high viscosity; improved corrosion protection	30	851	0.011	9	3-6	6-8	226	–	–	–
<b>ANTICORIT RPO 3003</b>	Conventional corrosion protection oil with high viscosity	30	871	0.010	9	3-5	5-8	226	–	–	–
<b>ANTICORIT BGI 15</b>	Corrosion protection oil with VCI; medium viscosity	14	865	0.006	5	3-6	9-15	155	–	•	•
<b>ANTICORIT BGI 21</b>	Corrosion protection oil with VCI	22	902	0.006	6	3-6	9-15	150	–	•	•
<b>ANTICORIT LBO 160 TT</b>	Corrosion protection oil with very high viscosity, suitable for use in low temperature situations	160	920	0.038	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	0.011	9	3-6	6-9	230	–	–	–
<b>ANTICORIT RP 30 NT</b>	Corrosion protection oil designed for steel mill application	30	889	0.010	9	3-6	6-9	172	–	–	–
<b>ANTICORIT RP 4107 A</b>	Mid-viscous, non thixotropic modification of ANTICORIT RP 4107 S	15	870	0.010	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	0.007	6	3-6	6-9	150	–	–	–
<b>ANTICORIT PL 3802 39 LV 8</b>	Low-viscous blank washing oil with advanced lubrication, non thixotropic	8	890	0.002	2	3-6	6-9	110	–	–	•

# 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 NT</b>	Non thixotropic modification of ANTICORIT PL 3802 39 S	26	880	0.009	8	3-6	6-9	n/a	–	–	•
<b>ANTICORIT PL 39 LV 8</b>	Low-viscous blank washing oil	8	880	0.002	2	3-6	6-9	116	–	–	•
<b>ANTICORIT PL 39 LV 18</b>	Mid-viscous blank washing oil	17	900	0.008	7	3-6	6-9	158	–	–	•
<b>Oily Corrosion Preventative Concentrates</b>											
<b>ANTICORIT RPC 5000</b>	Corrosion protection concentrate, successor of OHK	85	887					248	–	–	–
<b>ANTICORIT MPC 5000</b>	Corrosion protection concentrate, advanced corrosion protection and lubrication performance, compatible with chlorinated solvents	90	890	Depends on conc.	Depends on conc.	Depends on conc.	Depends on conc.	240	–	–	–
<b>ANTICORIT 03 W C</b>	High-viscous, thixotropic corrosion protection concentrate; suitable for bearings	160	912					150	•	–	–

## Corrosion Preventives

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	Optimized 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, suitable for bearings	14	860	0.006	5	12-24	12-36	130	•	–	•
<b>ANTICORIT LBO 18 X</b>	Thixotropic corrosion protection oil with very good lubrication properties	15	860	0.006	5	12-18	12-24	130	•	–	•
<b>ANTICORIT TX 11</b>	Thixotropic corrosion protection oil with very good lubrication properties; suitable for bearings	40	883	0.034	30 at 60 °C	6-12	12-24	160	•	–	•
<b>ANTICORIT TW 16</b>	High-viscous corrosion protection oil for hot applications	32 at 50 °C	883	0.012	11 at 85 °C	6-12	12-24	170	•	–	–
<b>ANTICORIT LSB</b>	Thixotropic corrosion protection oil	140	907	0.011	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	0.005	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	0.012	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	0.002	2	4-8	8-16	150	•	–	–
<b>ANTICORIT PL 3802 39 S</b>	First generation thixotropic prelube, meets VDA 230-213	60	910	0.012	11	6-12	12-20	180	•	–	•
<b>ANTICORIT PLS 100 T</b>	Second generation thixotropic prelube, meets VDA 230-213	100	910	0.012	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	0.007	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	•	–	•

# 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	Optimized 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	0.013	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	0.012	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	0.010	5	9-12	18-24	>60	–	–	–
<b>ANTICORIT 04 W 2</b>	Pre-diluted corrosion protection oil, 75% evaporation residue, isoparaffin, suitable for bearings	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, suitable for bearings	47 at 20 °C	920	Depends on conc.	Depends on conc.	6-12	12-20	>90	–	–	–

## Corrosion Preventives

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	Optimized 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	0.010	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	0.010	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	0.012	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	0.012	2.5	6-12	12-24	>60	–	–	–
<b>ANTICORIT DFO 8101</b>	Dewatering fluid, leaving a thin, oily protection layer, isoparaffin	2.4 at 20 °C	780	0.013	1	3-6	6-12	>60	–	–	–
<b>ANTICORIT DFO 8301</b>	Dewatering fluid, leaving a thick, oily protection layer, isoparaffin	4 at 20 °C	800	0.013	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. BImSchV	4.4 at 20 °C	820	0.012	1	3-6	6-12	>90	–	–	–
<b>ANTICORIT DFO 9301</b>	Dewatering fluid, leaving a thick, oily protection layer, VOC-free acc. to 31. BImSchV	7.2 at 20 °C	835	0.012	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	0.013	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	0.010	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	0.013	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	0.012	2.5	6-12	12-24	>60	•	–	–
<b>ANTICORIT DFW 8101</b>	Dewatering fluid, leaving a thin, waxy protection layer, isoparaffin	3.5 at 20 °C	780	0.013	1	3-6	6-12	>60	•	–	–
<b>ANTICORIT DFW 8301</b>	Dewatering fluid, leaving a thick, soft waxy protection layer, isoparaffin	3.7 at 20 °C	800	0.013	2.5	6-12	12-24	>60	•	–	–

# 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	Optimized lubricating properties
<b>Water Displacing Corrosion Protection Products</b>											
<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	0.012	1	3-6	6-12	>90	•	–	–
<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	0.012	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	0.010	2	6-12	12-24	>100	•	–	–
<b>ANTICORIT DFW 9601</b>	Dewatering fluid, leaving a very thick waxy protection layer, VOC-free according to 31. BlmSchV	10.4 at 40 °C	855	0.010	5	9-15	18-24	>100	•	–	–
<b>Water-miscible, Oily Corrosion Protection Products</b>											
<b>ANTICORIT WMC 7000</b>	Emulsifiable corrosion protection oil with good performance	60	922					>175	–	–	–
<b>ANTICORIT WMC 9000</b>	Emulsifiable corrosion protection oil with high performance	100	942					>175	–	–	–
<b>ANTICORIT WMC 9002</b>	Emulsifiable oil with high corrosion protection on steel and zinc, supports forming processes	100	910	De- pends on conc.	De- pends on conc.	De- pends on conc.	De- pends on conc.	>150	–	–	–
<b>ANTICORIT MKR 10</b>	Emulsifiable corrosion protection oil with high performance and thixotropic characteristics	128	931					>150	•	–	–
<b>Water-miscible, Synthetic Corrosion Protection Product</b>											
<b>ANTICORIT SKR 3001</b>	Mineral oil-free (synthetic) corrosion protection concentrate	–	1030	De- pends on conc.	De- pends on conc.	–	<1	–	–	•	–

## Corrosion Preventives

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	Optimized lubricating properties
<b>Corrosion Protection Coatings</b>											
<b>ANTICORIT BW 10</b>	Solvent containing corrosion protection wax, leaves a transparent touch dry film	FT - 4mm nozzle = 20s	822	0.066	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	0.025	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	0.311	50	12-36	12-36	>60	•	–	–
<b>ANTICORIT HKW 350 M</b>	Solvent containing corrosion protection wax for cavity protection	FT - 4mm nozzle = 27s	950	0.142	30	12-36	12-36	>60	•	–	–
<b>ANTICORIT CPX 3373</b>	Solvent-free, high performance corrosion protection coating with thixotropy; curing oxidatively	dyn. visc. at 300 1/min = 350m*Pas	1050	0.048	75	>36	>36	>135	•	–	–
<b>ANTICORIT CPX 3373 VW LV</b>	Solvent-free, high performance corrosion protection coating with lower thixotropy; curing oxidatively	dyn. visc. at 300 1/min = 170m*Pas	1050	0.048	30	>24	>24	>220	•	–	–
<b>ANTICORIT CPX 3373 VW HV</b>	Solvent-free, high performance corrosion protection coating with higher thixotropy; curing oxidatively	dyn. visc. 300 1/min = 190m*Pas	1050	0.048	75	>36	>36	>160	•	–	–
<b>ANTICORIT CPX 3230</b>	Solvent-free, high performance corrosion protection coating with very high thixotropy; curing oxidatively; suitable for underbody application	dyn. visc. at 300 1/min = 1300 m*Pas	1080	0.139	150	>36	>36	>130	•	–	–
<b>ANTICORIT CPX 3320</b>	Solvent-free, high performance corrosion protection coating with thixotropy; curing oxidatively; low odour	dyn. visc. at 300 1/min = 250m*Pas	1090	0.046	50	>36	>36	>130	•	–	–

\*) Value of pure product

# ANTICORIT

Product name	Description	Iron, Steel	Copper	Aluminium	Film weight [g/m <sup>2</sup> ]	Shed storage [Mon.]	Hall storage [Mon.]	FP [°C]	Thixotropic	VCI	Optimized 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 e. g. power train components and body in white parts	•	•	•	–	≤6	≤24	>60	–	•	–
<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 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 Preventives

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	Optimized lubricating properties
<b>Maintenance Fluids for Dewatering Products</b>											
<b>ANTICORIT DF 8000</b>	Water displacement, leaving no residues, isoparaffin solvent	1.8 at 20 °C	777	–	–	–	–	>60	–	–	–
<b>ANTICORIT DF 9000</b>	Water displacement, 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	–	–	–

# 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.]
<b>Spraying Cans</b>							
<b>ANTICORIT 5F</b>	Rust preventative spray forming a film with active water displacement	3.7 at 20 °C	813	–	2.5	6-12	12-24
<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>	Rust preventative spray, after evaporation a highly viscous film is formed	8.5	851	–	5	3-6	6-12
<b>ANTICORIT RPC</b>	Classic anti-corrosive oil and contact spray, multipurpose	84	887	–	5	6-12	6-24
<b>ANTICORIT CPX 3373</b>	Solvent-free and durable high performance corrosion protection coating; drying oxidatively	Dyn. visc. at 300 1/min = 350m*Pas	1050	–	50	>36	>36
<b>ANTICORIT CPX 3373 UBC</b>	Non-dripping corrosion protection coating for vehicle underbodies, drying oxidatively	Dyn. visc. at 300 1/min = 1300m*Pas	1080	–	50	>36	>36
<b>ANTICORIT SYNTH</b>	Synthetic multipurpose oil	102	834	–	15	3-6	6-12
<b>ANTICORIT RP 4107 S</b>	Thixotropic corrosion protection oil, meets VDA 230-213	35	887	–	11	6-12	12-20



## FORMING LUBRICANTS

The success of a perfect metal forming depends on three factors: the material, the forming process including the tools being used and last but not least the forming lubricant. FUCHS offers lubricants for almost all forming processes. They stand for highest quality and excellent application results - no matter whether for drawing/deep drawing, punching, fine blanking, cold extrusion, wire-, tube- and bar drawing or hydroforming. With RENOFORM and WISURA forming lubricants you maximise efficiency, durability and plant safety. You minimise wear, the environmental impact and follow-up costs. By using our highly effective FUCHS lubricant formulations, you optimise your forming processes all along the line.



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## Forming Lubricants

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## Forming Lubricants

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [g/ml]	Flash point [°C]	Steel carbon (a. alloyed, zinc plated)	Steel, stainless	Aluminum	Copper alloys
<b>Non Water-miscible Forming Lubricants for Deep Drawing</b>								
<b>WISURA DYO 3001</b> (ZO 3107/22)	Low-viscosity high-performance lubricant for non-ferrous materials	21	0.87	200	•	•◦	••	••
<b>RENOFORM DMO 3009</b> (96)	Classic multipurpose lubricant	39	0.92	182	••	•	•	◦
<b>WISURA DYO 4004</b> (ZO 3408)	High-performance lubricant for deep drawing of different kind of materials	45	0.96	180	••	•	••	••
<b>WISURA DSO 5005</b>	Synthetic high-performance lubricant for deep drawing of different kind of materials	97	0.96	>180	••	•	••	••
<b>WISURA FMO 5001</b> (ZO 3180)	Classic multipurpose lubricant at higher viscosity level	117	0.98	180	••	•◦	•◦	◦
<b>WISURA DSO 5015</b>	Synthetic high-performance lubricant for deep drawing of stainless steel	175	1.00	>180	•	••	◦	◦
<b>WISURA DYO 5001</b> (ZO 3107/180)	High viscous, high-performance lubricant for non-ferrous materials	180	0.90	200	•	◦	••	••
<b>Water-miscible Forming Lubricants for Deep Drawing</b>								
<b>WISURA DSW 4003 B</b>	Synthetic, water-miscible high-performance lubricant for deep drawing for many purposes	5	1.02	–	••	◦	◦	◦
<b>RENOFORM DMW 5004</b> (MBW 677/6)	Mineral oil based, water-miscible high-performance lubricant	165	0.98	200	•	•	•	◦
<b>WISURA DSW 6002</b>	Water-miscible synthetic high-performance lubricant for the most demanding forming operations, especially for carbon steels	276	1.04	–	••	•	◦	◦
<b>WISURA FSW 6005</b>	Water-miscible synthetic high-performance lubricant for the most demanding forming operations, also for stainless steels, also suitable for fine blanking	300	1.02	180	••	••	•	◦
<b>Pasty, Non Water-miscible Forming Lubricants for Deep Drawing</b>								
<b>RENOFORM DMP 8004</b> (HBT 581/3)	Pasty, mineral oil containing and non-water miscible high-performance lubricant	–	0.97	–	•	•◦	•	◦
<b>Pasty, Water-miscible Forming Lubricants for Deep Drawing</b>								
<b>WISURA DSP 9001</b> (Pressalin)	Synthetic water-miscible high-performance lubricant for various demanding deep-drawing operations	–	1.00	–	•	•	•	◦

# RENOFORM, WISURA

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [g/ml]	Flash point [°C]	Steel carbon (a. alloyed, zinc plated)	Steel, stainless	Aluminum	Copper alloys
<b>Forming Lubricants without Solvents for Blanking</b>								
<b>WISURA DMO 2003</b>	Low-viscosity high-performance blanking oil for carbon steels	8.3	0.85	170	••	•◦	•	•
<b>WISURA BSO 3001</b> (AK 3080)	High-performance blanking oil particularly for non-ferrous materials	20	0.84	172	•	•	••	••
<b>WISURA DMO 3027</b>	High-performance blanking oil for carbon steels	29	0.93	190	••	◦	◦	◦
<b>RENOFORM DMO 3009</b> (96)	Classic universal forming lubricant	39	0.92	182	•	•	•	◦
<b>WISURA DSO 4001</b> (ZO 3368)	High-performance blanking oil of medium viscosity for processing a wide range of materials	51	0.98	180	••	••	••	•◦
<b>Forming Lubricants with Solvents for Blanking</b>								
<b>RENOFORM BMV 1016</b> (UBO 377/1)	Almost completely evaporating forming lubricant for easy applications	1.2	0.79	62	•	•◦	•	•
<b>PLANTOFORM BSO 1002</b>	Almost residue-free evaporating forming lubricant for more demanding applications from renewable raw materials	5.4	0.86	130	•	••	•	••
<b>WISURA DMV 1011</b>	Evaporating forming lubricant with low residue	1.2	0.79	62	•◦	◦	••	•
<b>WISURA DMV 1009</b>	Evaporating forming lubricant with low residue for demanding operations	1.6	0.80	63	•	◦	••	••
<b>RENOFORM BMV 2003</b> (LVO 1518)	Partially evaporating forming lubricant, additivated especially for demanding applications	3	0.84	>102	•	•	•	◦
<b>WISURA DMV 1012</b>	Evaporating forming lubricant for demanding applications	4	0.82	62	••	••	••	••
<b>WISURA DYV 2001</b> (ZO 3107/5)	Partially evaporating forming lubricant, particularly for aluminum	5	0.83	65	•	◦	••	••

## Forming Lubricants

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [g/ml]	Flash point [°C]	Steel carbon (a. alloyed, zinc plated)	Steel, stainless	Aluminum	Copper alloys
<b>Forming Lubricants for Fine Blanking</b>								
<b>RENOFORM DMO 3009</b> (96)	Classic multipurpose forming lubricant also for fine blanking with low viscosity lubrication	39	0.92	182	•	•	•	○
<b>WISURA FMO 5020</b>	High-performance lubricant for various forming technologies, with special FEINTOOL approval	110	0.96	200	••	○	•○	○
<b>WISURA FMO 5001</b> (ZO 3180)	Classic multipurpose forming lubricant in higher viscosity	117	0.98	180	••	•○	•○	○
<b>WISURA FMO 5010</b>	Higher viscosity version of WISURA FMO 5020	170	0.94	200	••	○	•	○
<b>WISURA FMO 5022</b>	High-performance fine blanking oil of the latest generation	183	0.97	>180	••	○	•	○
<b>WISURA DSO 5012</b>	High-performance fine blanking oil of the latest generation for stainless steel applications	167	1.03	>180	•	••	○	○
<b>Forming Lubricants for Cold Forging – Heavy Forming</b>								
<b>WISURA FSO 4001</b>	Sulphur-free high-performance lubricant	93	0.95	180	•	••	•	••
<b>WISURA EMO 5002</b> (ZO 3373)	Universal high-performance lubricant for cold forging even at elevated temperatures	127	0.93	200	••	•	••	○
<b>Forming Lubricants for Cold Forging – for Circular Lubrication</b>								
<b>WISURA DMO 4039</b>	Universal high-performance lubricant for circular lubrication	77	0.91	200	••	•	•	•
<b>WISURA EMO 4020</b>	High-performance lubricant for circular lubrication	93	0.95	>180	••	•	•	•
<b>Non Water-miscible Forming Lubricants for WTB Drawing (Wire - Tube - Bar)</b>								
<b>WISURA ESO 5002</b>	Multi and high-performance lubricant for extrusion, also difficult calibration	110	0.98	180	••	•○	•○	○
<b>WISURA DSO 7010</b> (LS 669)	High-performance lubricant for drawing of seamless, stainless steel tubes	1014	1.00	>180	•	••	•	○
<b>WISURA TYO 8003</b>	High-performance lubricant for copper tube drawing	2600	0.88	180	○	○	○	•
<b>Water-miscible Forming Lubricants for WTB Drawing (Wire - Tube - Bar)</b>								
<b>RENOFORM TYW 4008</b>	Synthetic high-performance lubricant for wire drawing	382	0.97	200	•	○	•	••

## RENOFORM, WISURA

Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [g/ml]	Flash point [°C]	Steel carbon (a. alloyed, zinc plated)	Steel, stainless	Aluminum	Copper alloys
<b>Non Water-miscible Forming Lubricants for Hydroforming</b>								
<b>WISURA HSO 5002</b>	High-performance outside lubricant	180	1.00	180	•	••	•◦	◦
<b>Water-miscible Forming Lubricants for Hydroforming</b>								
<b>WISURA DSW 2004</b>	Boron-free pressurising lubricant	1.1	1.06	–	•	◦	•	•

## Forming Lubricants

## RENOFORM



Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [g/ml]	Copper- striptest	Flash point [°C]	Materials	Application
<b>VDA Forming Lubricants</b>							
<b>RENOFORM MCO 3802 SN</b>	Spot lubricant in the car body shop for light to medium forming- and stamping operations, fulfils the requirements of VDA 201-213	100	0.91	2	142	Steel and aluminium	Drawing and deep drawing
<b>RENOFORM MCO 3028</b>	Spot lubricant in the body shop for medium and heavy forming operations, fulfils the requirements of VDA 201-213	130	0.91	4	155	Cold-rolled steel, galvanised steels and aluminium surfaces	Drawing and deep drawing
<b>RENOFORM MCO 3028 LV</b>	Predominantly fast evaporating forming lubricant for stamping, bending and light drawing operations, evaporation residue corresponds to RENOFORM MCO 3028	2.5 @ 20 °C	0.77	4	260	Cold-rolled steel, galvanised steels and aluminium surfaces	Easy drawing operations
<b>RENOFORM MCO 3028 MV</b>	Spot lubricant in the car body shop for light to medium forming- and stamping operations	7	0.85	4	100	Cold-rolled steel, galvanised steels and aluminium surfaces	Easy and medium drawing operations

## Rolling Oils

## RENOFORM



Product name	Description	Kin. visc. at 40 °C [mm <sup>2</sup> /s] DIN 51562	Density at 15 °C [g/ml]	Copper- striptest	Flash point [°C]	Materials	Application
<b>Non Water-miscible Rolling Oils</b>							
<b>RENOFORM WO 52 B</b>	Cold rolling oil and skin pass oil with excellent corrosion protection	6	0.85	1	>100	Ferrous and non-ferrous metals	Cold rolling, re-rolling and corrosion protection
<b>RENOFORM WO 79 A</b>	Cold rolling oil with additional EP additives	9	0.85	1	>170	Ferrous and non-ferrous metals	Cold rolling oil with additional EP additives
<b>RENOFORM CCO 40</b>	Cold rolling for non-ferrous metals	4,8	0.82	1	148	Ferrous and non-ferrous metals	Cold rolling of copper alloys

# Industrial Product Brochures



Hydraulic oils – RENOLIN



Gear and general lubricating oils – RENOLIN



Lubricants for turbines – RENOLIN



Compressor Oils – RENOLIN



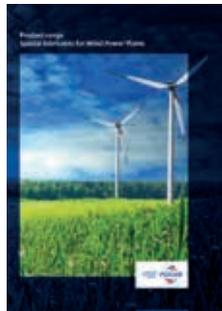
Lubricants for the paper industry – RENOLIN / RENOLIT / PLANTO



Slideway oils – RENEPLANTO



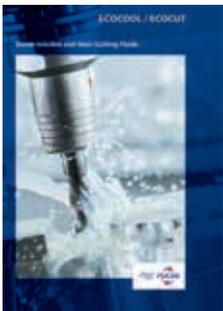
Refrigeration oils – RENISO



Special lubricants for wind power plants



Rapidly biodegradable industrial lubricants – PLANTO



Water-miscible and Neat Cutting Fluids – ECOCOOL / ECOCUT



Lubricant solutions for the medical technology



AEROSPACE lubricants – ECOCOOL / ECOCUT



ECOCOOL GLOBAL 10 PLUS – Metal working fluid for aerospace



Quenching Oils and Polymer Quenchants – THERMISOL



Cleaner for metalworking – RENOCLEAN



Skin protection, skin cleansing and skin care – RENOCLEAN

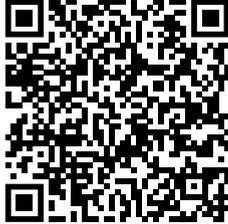


Lubricants in spray cans

## Videos



Hydraulic oil RENOLIN XtremeTemp in the field test



The high efficiency of RENOLIN XtremeTemp



Cavity conservation in practice – ANTICORIT CPX®



Comparison of flaming behaviour – universal high-performance quenching oil THERMISOL QH 35 MC (right in the video)

### Note

The information contained in this product information 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 aircraft or spacecraft. Our products may be used in the manufacture of components for aircraft or spacecraft if they are removed without residue from the components prior to assembly into the aircraft or spacecraft.

The information given in this product information represents general, non-binding guidelines. No warranty expressed or implied is given concerning the properties of the product or its suitability for any given application. We therefore recommend that you consult a FUCHS 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 of our product information sheets at any time and without warning, unless otherwise provided in customer-specific agreements. With the publication of this product information, all previous editions cease to be valid. Any form of reproduction requires express prior written permission from FUCHS SCHMIERSTOFFE GMBH.

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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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