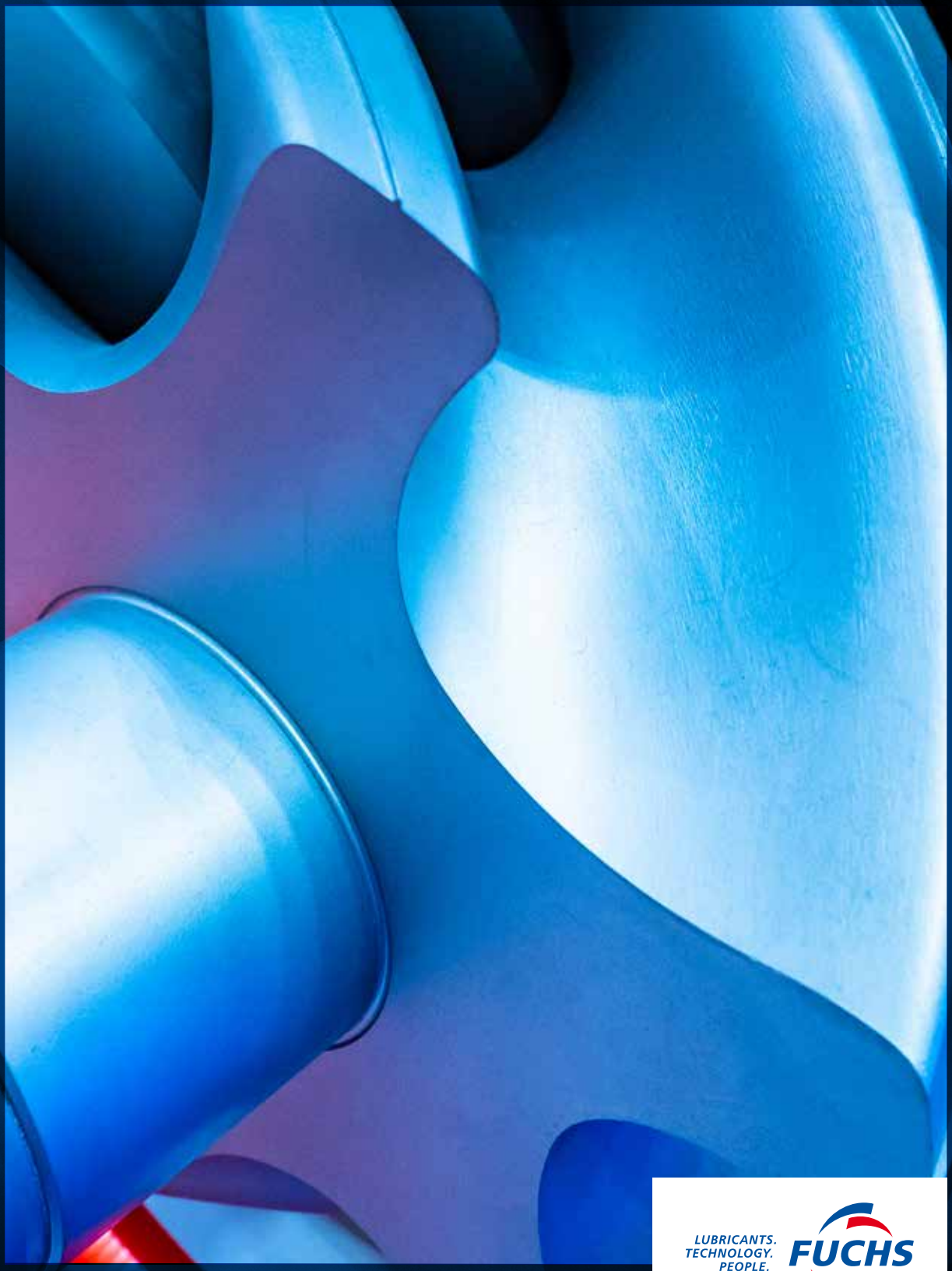
RENOLIN

Compressor Oils



LUBRICANTS.
TECHNOLOGY.
PEOPLE.

FUCHS

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.

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 and the German mechanical engineering companies

FUCHS has developed, produced and sold lubricants and related specialties for more than 90 years – for virtually all areas of application and sectors. With over 100,000 customers and 69 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.

FUCHS lubricants stand for performance and sustainability, for safety and reliability, for efficiency and cost savings. They represent a promise: technology that pays off.

ITS ALL ABOUT THE RIGHT LUBRICANT

Today compressed air is an important energy source for a lot of technical applications. So producing compressed air reliably is very important for the users. That's why air compressors are key for a lot of industrial applications.

Cover picture: Siemens AG

The requirements for air compressor lubricants

Since short oil lifetime or failures can lead to production stoppages, the use of the right lubricant is a prerequisite for safe and economical operation of the systems. In recent years, the compressed air systems have been continuously optimized and so today higher demands are placed on modern air compressor lubricants.

The operator expects longer maintenance intervals on the systems and thus longer oil life for the compressor lubricants. But not only have the oil change intervals been extended, the oil temperatures have also risen while the oil volume has been reduced at the same time.

In order to master these requirements reliably, FUCHS has developed special RENOLIN air compressor lubricants and subjected them to tough practical tests.

Air compressor lubricants as essential construction element

The lubrication has a significant influence on the behavior of compressors and their availability.

Therefore, in order to maintain reliable, economical and safe operation, the selection and correct application of the lubricant is of particular importance. FUCHS offers you the right air compressor lubricant for your compressor and your special application.

The main tasks of a compressor lubricant include:

- Lubricating the bearings
- Sealing (minimizing backflow losses)
- Dissipation of compression heat
- Corrosion protection (iron and non-ferrous metals)
- Wear protection

To meet these requirements, high-performance air compressor lubricants need the following properties:

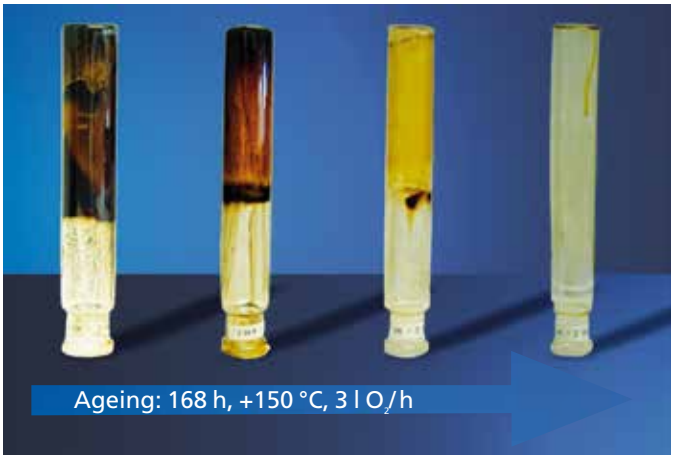
- excellent oxidative and thermal stability
- low evaporation / coking tendency
- low foaming tendency
- good long-term viscosity-temperature behavior
- good air release properties
- high corrosion protection
- excellent aging resistance
- long service life
- good filtration behavior
- extremely low residue formation

In particular the temperature and aging resistance (thermal / oxidative stability; tendency to evaporate / coke) are of great importance for safety reasons and in order to achieve a long service life.

In recent years screw compressors have not only gained market share but also their performance efficiency could be increased. Today's systems have a higher specific output with a smaller size. Among other things, this leads to increased requirements for the lubricants used, since the amount of oil available for cooling and lubrication is steadily decreasing.

In order to reduce operating costs and minimize downtimes for maintenance, the maintenance intervals have been extended. This extension also automatically leads to the extension of the oil change intervals. This and higher air compression end temperatures represent an increasing load on the compressor oils. For example, many systems are already operated with air compression end temperatures of up to 110 ° C. In general, the final compression temperatures are lower and in the range of 80° C - 95° C.

Thermal stability / sludge tendency
(FUCHS Inhouse Test)



Typical oil filling volumes in screw compressors

Power [kW]	Volume Oil [l]	Oil circulation rate [l / min]	Oil circulation No.
30	8	28	3,50
75	25	75	3,00
130	230	180	0,78
200	230	200	0,87
280	224	280	1,25

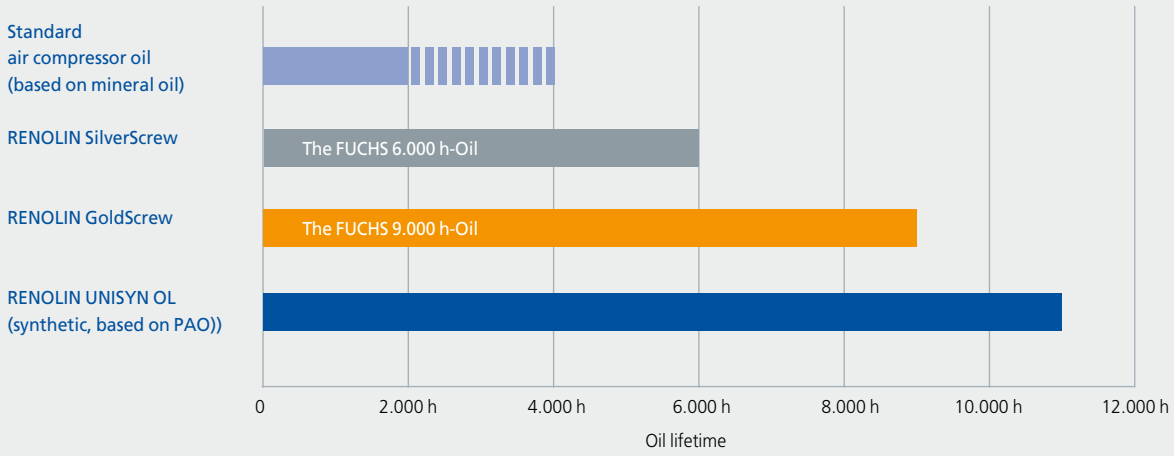
Lifetime & oil change intervals of screw compressor oils. Average values at 85°C discharge temperature

Oil lifetime*	Performance level	Product
2.000 h – 3.000 h	Basic performance	RENOLIN SilverScrew **The FUCHS 6000 h-Oil**
3.000 h – 4.000 h	Medium performance	RENOLIN SilverScrew **The FUCHS 6000 h-Oil**
4.000 h – 6.000 h	Medium – high performance	RENOLIN SilverScrew **The FUCHS 6000 h-Oil**
6.000 h – 9.000 h	High performance	RENOLIN Gold Screw **The FUCHS 9000 h-Oil**
9.000 h – 12.000 h	Highest performance	RENOLIN UNISYN OL (Basis PAO)
12.000 h – 15.000 h	Highest performance	RENOLIN SynAir 46 (Basis PAG/Ester)

* Oil lifetime at reference conditions:
- Discharge temperature 85 °C
- Average ambient temperature 10-30°C/ average ambient air quality,

FUCHS air compressor oils – For extra long oil change intervals

Pict. 1: Standard air compressor oil in comparison to FUCHS High Performance Products



Air compressor lubricants in practice

Lubricants for turbo compressors and synthesis gas compressors

RENOLIN ETERNA-range

High-quality gas and steam turbine oils of the latest generation based on highly refined, hydrogenated Group III base oils. Very high aging resistance, good corrosion protection and excellent wear protection. Also suitable for use as circulating oil and lubricating oil for turbo compressors, blowers and „oil-free compressors“ (lubricant regulations and recommendations of the system manufacturer / compressor manufacturer must be observed).

RENOLIN ETERNA SGV-range

High-quality gas and steam turbine oils of the latest generation based on highly refined, hydrogenated Group III base oils. Very high aging resistance and excellent corrosion protection. For use as a lubricating and circulating oil for turbo compressors, oil-free compressors and special developed for use in synthesis gas compressors (ammonia / synthesis gas). Free of anti-wear additives, highest thermal stability.

The products of the RENOLIN ETERNA and RENOLIN ETERNA SGV series are based on the latest lubricant technology. They are long-life, high-performance, low-varnish turbine oils of the highest thermal and oxidative stability. Well-known approvals from manufacturers (Siemens AG; MAN Turbo AG, etc.) are available. The products of the RENOLIN ETERNA and RENOLIN ETERNA SGV series meet and exceed the requirements for high-performance turbine oils according to DIN 51515- Part 1 and Part 2.

RENOLIN ETERNA CLEAN

Polar cleaning fluid for turbine and compressor oil circuits. RENOLIN ETERNA CLEAN has a high solvency for varnish and oil degradation products. RENOLIN ETERNA CLEAN is added to the lubricating oil circuit before the scheduled oil change. Oil deposits, varnish products and other residues can be effectively removed from the lubricating oil system. The recommended concentration for use is 7 – 10%.

Compatible with common turbine and compressor oils. Free of detergents - therefore no deterioration in the air and water separation properties, no foam problems!

Lubricants for piston and vane compressors - lubricant requirements according to DIN 51506

The requirement to extend the oil change intervals also applies to piston, vane and rotary compressors. In general, the final compression temperatures of the plants have remained high and are even tending to rise. The demands for longer oil change intervals and the associated longer oil lifetime often place increased demands on the formulations of this product group oxidative requirements of air compressor oils. At the same time, one expects a longer service life, better oxidation stability and longer service intervals.

These requirements can only be met with products of the highest quality and purity in conjunction with the latest additive technology and specially selected base oils. In addition, the requirements of DIN 51506 (minimum requirements for compressor oils) – especially for so-called VDL oils – must be met and exceeded. FUCHS offers an extensive range of high-performance compressor oils.

RENOLIN 500-range

Special, highly aging-resistant mineral oil cuts with ash-free active ingredients to increase the protection against oxidation and corrosion. Coordinated additives prevent the formation of deposits in highly stressed pressure valves. The oils of the RENOLIN 500 series meet and exceed the requirements for lubricating oils VDL according to DIN 51506. In particular they reliably pass the aging test in this standard, which is made more stringent by the addition of iron oxide. RENOLIN 503 - ISO VG 68, RENOLIN 504 - ISO VG 100, RENOLIN 505 - ISO VG 150, RENOLIN 506 - ISO VG 220

Lubricants for screw compressors

RENOLN VAC 100 F
A universally applicable high-performance vacuum pump oil based on selected mineral oil with no additives. This special compressor lubricant has excellent thermal-oxidative stability and can be used in vacuum pumps up to a pressure level of 10^3 to 10^4 mbar.

RENOLIN UNISYN OL-range
Fully synthetic high-performance air compressor oils based on synthetic polyalphaolefin base oils. The products have a high natural viscosity index, excellent low-temperature behavior and outstanding air separation properties. The oils of the RENOLIN UNISYN OL series can also be used as fully synthetic HVLP hydraulic oils in accordance with DIN 51524. RENOLIN UNISYN OL oils are recommended for use in compressors, pumps and hydraulic systems subject to high thermal loads. Depending on the viscosity, they are suitable for turbo, screw, piston and vane compressors and are also used successfully for compressors in the gas / hydrocarbon sector.

RENOLIN SE-range
The air compressor oils based on special, fully synthetic and saturated high-performance esters are characterized by maximum oxidative and thermal stability. Even at high temperatures and long periods of use they prevent coking, deposits and the formation of carbon residues. By using these special synthetic products the oil change intervals can be significantly extended. The products meet and exceed the requirements of DIN 51506 group VDL. RENOLIN SE products are suitable for piston and vane compressors, even under very difficult operating conditions such as high compression temperatures and high pressure levels. They are recommended for systems in which classic air compressor oils based on mineral oil and conventional synthetic compressor oils lead to coking and the formation of residues.

RENOLIN Silver Screw
The products of the RENOLIN SilverScrew series are high-tech air compressor fluids with high oxidative and thermal stability for an extended oil service life of up to 6,000 operating hours. The products are particularly recommended for use in oil-injected screw compressors. They can also be used in piston and vane compressors. The newly developed products of the RENOLIN SilverScrew series meet and exceed the DIN 51506 VDL requirements and can be used universally. They are generally miscible and compatible with other mineral oil-based compressor oils.

RENOLIN Gold Screw
The RENOLIN GoldScrew range of products are outstanding high-tech air compressor fluids with extremely high oxidative and thermal stability. They are designed for an extended service life of up to 9,000 operating hours. The lubricants of the RENOLIN GoldScrew series represent the highest class of base oil and additive technology in the field of oil-injected screw compressors. With the use of these products, the oil change intervals can be extended considerably. The products also represent an alternative to PAO-based compressor oils. They are generally miscible and compatible with other mineral oil-based compressor oils.

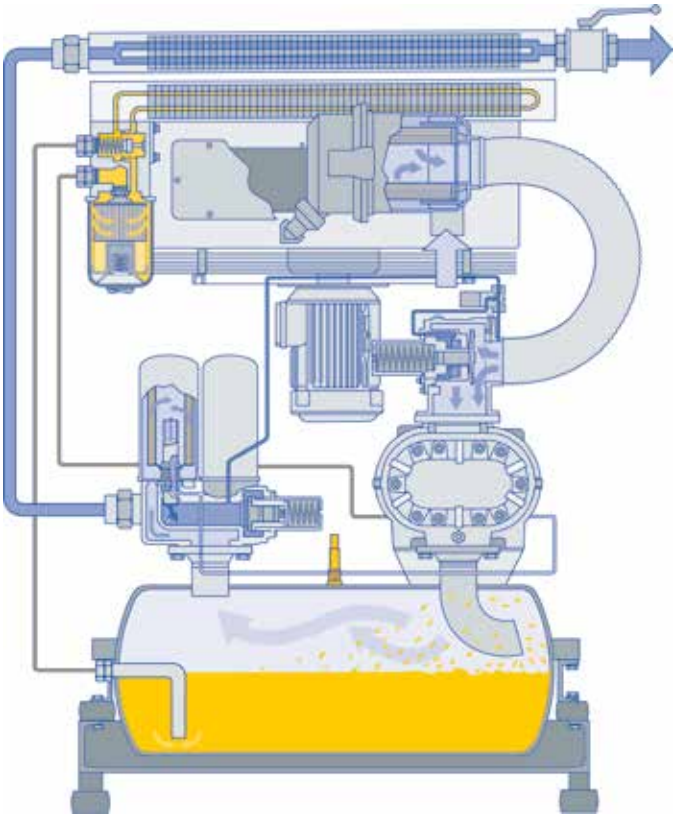
RENOLIN SynAir 46
Fully synthetic air compressor oil based on selected polyglycol (PAG) components in conjunction with saturated synthetic ester. RENOLIN SynAir 46 shows a very good biodegradation according to OECD 301C (> 60%). The excellent viscosity-temperature behavior, the high shear-stable viscosity index in connection with excellent oxidation resistance and good thermal stability characterize this high-performance compressor oil. The lubricant is designed for use in oil-injected screw compressors with a high final compression temperature and extended oil service intervals. The conversion guidelines from mineral oils to polyglycol oils must be observed.

Gas compressor oils

RENOLIN LPG 100, RENOLIN LPG 185

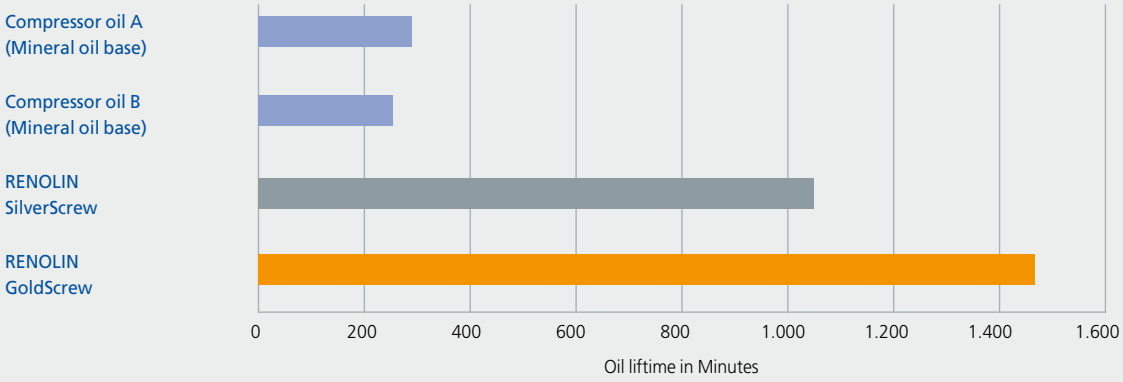
Fully synthetic gas compressor oils based on polyalkylene glycol (PAG). Suitable for process gases and refinery gases as well as other hydrocarbon gases (e.g. propane, propene, butane and others) and their mixtures. The oils have a low hydrocarbon solubility and are recommended for use in reciprocating and screw compressors.

RENOLIN LPG 100 and RENOLIN LPG 185 should be dried if they are to be used in hermetic cooling systems. RENOLIN LPG 100 and RENOLIN LPG 185 are characterized by their favorable solubility characteristics with hydrocarbons. The use of specially selected PAG base fluids minimizes the dilution of the lubricant in the application. This results in a stable lubricating film with good lubrication properties and thus reliable wear protection.

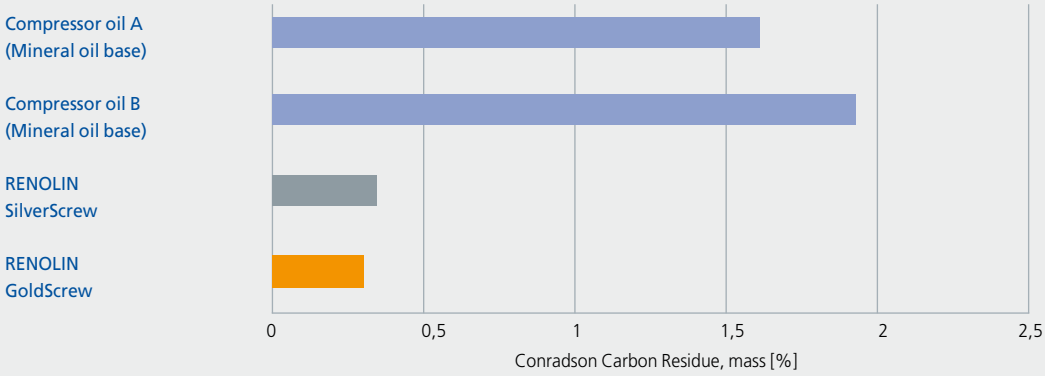


FUCHS always offers you the right fluid for your screw compressor

Oxidation stability RPVOT at 150°C according to ASTM D-2272
Pict. 2: Typical results for common screw compressor oils ISO VG 46 (RPVOT Test).



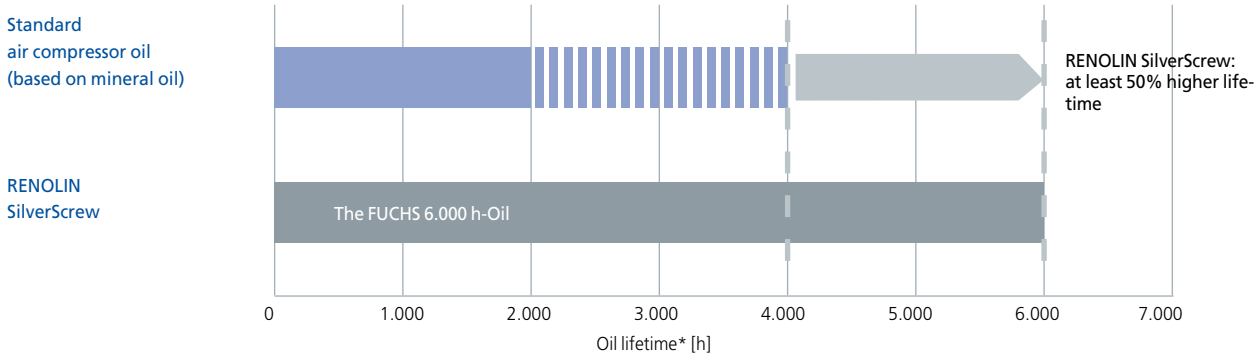
Ageing behavior according DIN 51 352-2:
Increase of Conradson Carbon Residue (CCR)
Pict. 3: Typical results for common screw compressor oils ISO VG 46
(Test acc. DIN 51352-2).



All information corresponds to the current state of knowledge and our development. We reserve the right to make changes. As of 04/2012

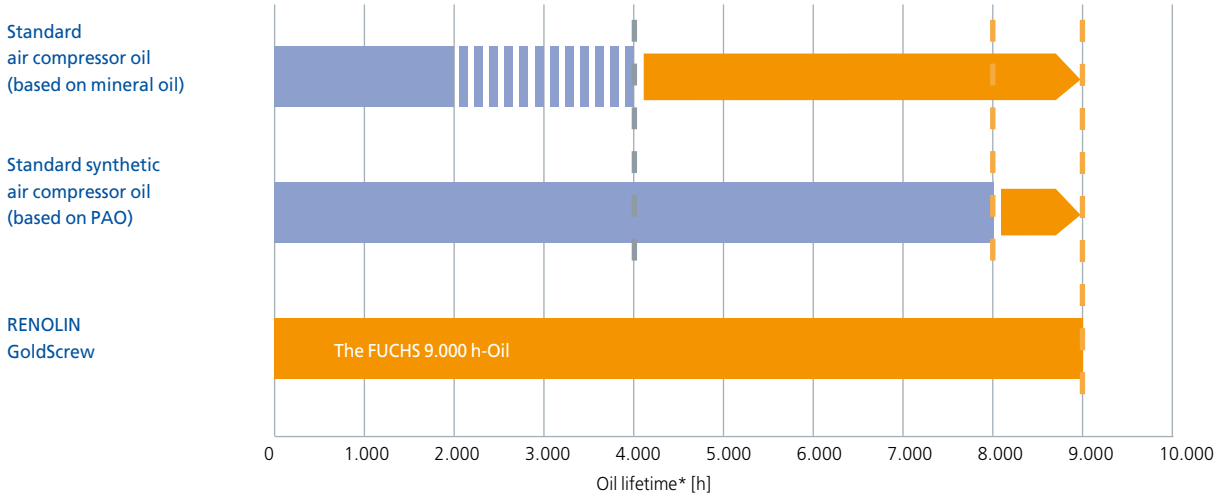
Comparison lifetime of air compressor oils*

Pict. 4: RENOLIN SilverScrew: At least 50% higher lifetime compared to standard air compressor oils



Comparison lifetime of air compressor oils*

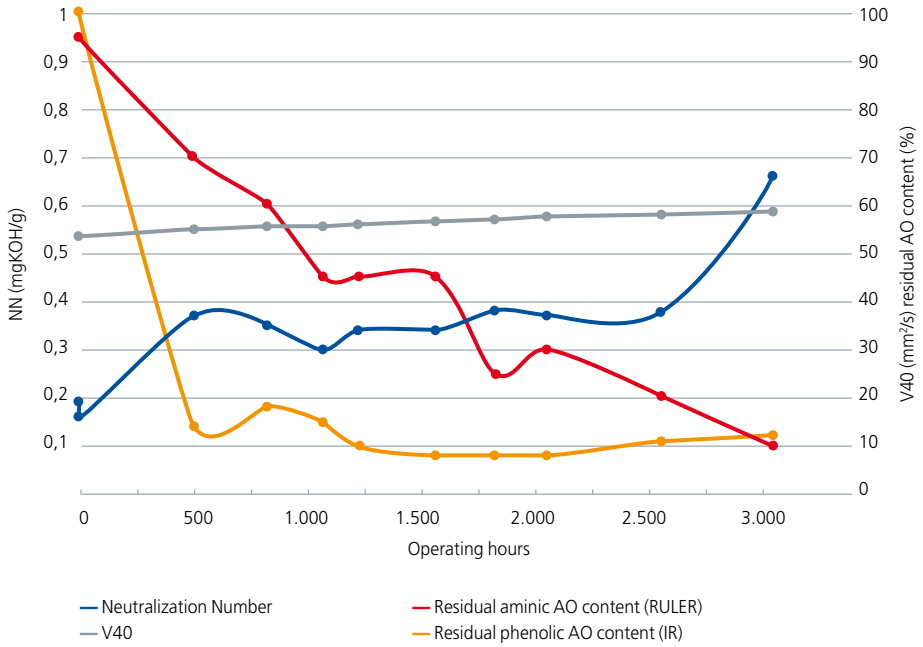
Pict. 5: RENOLIN GoldScrew: For highest oil lifetime. RENOLIN GoldScrew outperforms synthetic air compressor oils.



* Oil lifetime at reference conditions:
- Discharge temperature 85 °C
- Average ambient temperature 10-30 °C / average ambient air quality,

FUCHS air compressor test with RENOLIN GoldScrew 46 (11 bar @ 100 °C)

Pict. 6: Test of RENOLIN GoldScrew 46 in the FUCHS screw compressor test rig: a lifetime of 3000 h at 100 °C corresponds to an oil lifetime of 9000 h at 85 °C.



FUCHS ageing test (120°C / 9 weeks)

Pict. 7: results after 9 weeks

	Competitor product/ Common technology	RENOLIN SilverScrew 46 / New FUCHS technology
Sediments in the oil	high amount	low
Photo oil		
Sediments on the roller	significant amount	none
Photo roller		

Industrial Oils

Product name	Description	Density at 15 °C kg/m³	Flash point Clev. °C	Kin. visc. at 40 °C mm²/s	Kin. visc. at 100 °C mm²/s	VI	Pour-point °C	Main application area
Turbine Oils / Turbo Compressor Oils								
RENOLIN ETERNA 32	**Range RENOLIN ETERNA** 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.
RENOLIN ETERNA 46		846	220	46	7.6	132	-15	
RENOLIN ETERNA 68		851	230	68	9.9	120	-15	
RENOLIN ETERNA 32 SGV	**Range RENOLIN ETERNA SGV** 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.
RENOLIN ETERNA 46 SGV		846	220	46	7.6	132	-15	
RENOLIN ETERNA Clean	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.

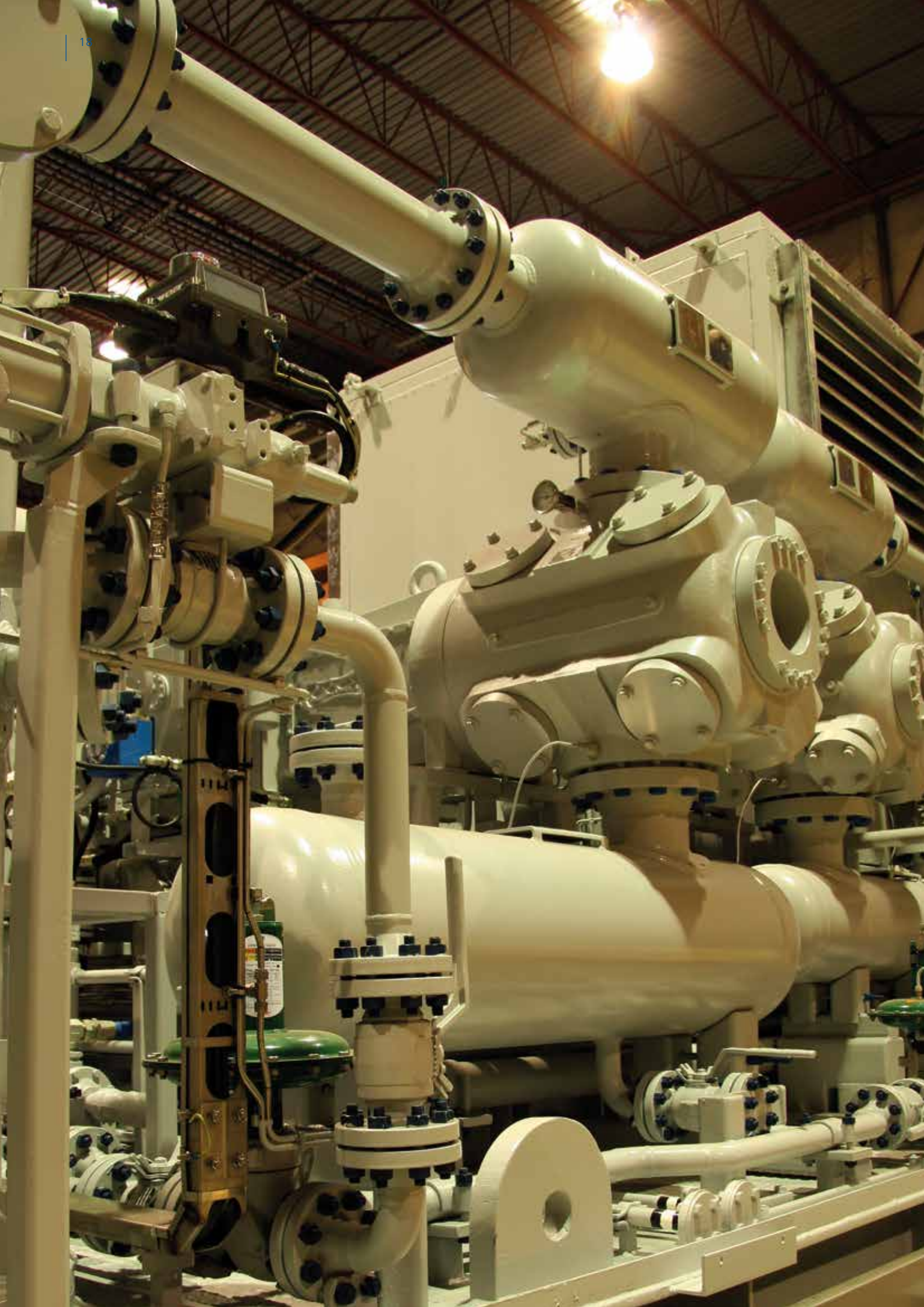
Product name	Description	Density at 15 °C kg/m³	Flash point Clev. °C	Kin. visc. at 40 °C mm²/s	Kin. visc. at 100 °C mm²/s	VI	Pour-point °C	Main application area
Screw Compressor Oils								
RENOLIN SilverScrew 32	**Range RENOLIN SilverScrew** High-tech air compressor fluids with high oxidative and thermal stability, which allows oil lifetimes of up to 6000h. Surpasses the requirements of DIN 51506:VDL. Corresponds to ISO 6743-3-DAJ. Corresponds to several OEM Requirements.	863	235	32	5.5	108	-38	Universal air compressor fluids for oil injected screw, vane and piston compressors.
RENOLIN SilverScrew 46		868	244	46	6.9	105	-36	
RENOLIN SilverScrew 68		870	255	68	9.0	106	-40	
RENOLIN GoldScrew 46	**Range RENOLIN GoldScrew** 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	260	-39	Universal air compressor fluids for oil injected screw, vane and piston compressors.
RENOLIN GoldScrew 68		871	278	68	9.4	278	-33	

Industrial Oils

Product name	Description	Density at 15 °C kg/m³	Flash point Clev. °C	Kin. visc. at 40 °C mm²/s	Kin. visc. at 100 °C mm²/s	VI	Pour-point °C	Main application area
Screw Compressor Oils								
RENOLIN UNISYN OL 32	**Range RENOLIN UNISYN OL** 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.
RENOLIN UNISYN OL 46		843	260	46	7.9	146	<-60	
RENOLIN UNISYN OL 68		845	260	68	10.6	144	-54	
RENOLIN UNISYN OL 100		849	260	100	14.2	146	-54	
RENOLIN UNISYN OL 150		849	250	150	19.4	148	-47	
RENOLIN SynAir 46	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%.
Piston and Rotary Vane Compressor Oils								
RENOLIN 503	**Range RENOLIN 500** 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.
RENOLIN 504		866	280	100	11.9	109	-21	
RENOLIN 505		875	275	150	15.0	100	-15	
RENOLIN 506		890	280	230	18.7	90	-12	
RENOLIN VAC 100 F	Special vacuum pump lubricant based on highly refined mineral oils. Does not contain any additives. Extremely low evaporation losses. Suitable for high vaccum.	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.
RENOLIN SE 68	**Range RENOLIN SE** Fully-synthetic air compressor oils based on advanced synthetic ester technology. Fulfils the requirements according to VDL DIN 51506	927	264	68	9.2	111	-36	High temperature stable ester oil for use in vane type and reciprocating compressors, even under severe conditions e.g. high temperatures. Especially suited for compressors where the use of a mineral oil can lead to coking and varnish.
RENOLIN SE 100		971	268	100	11.1	97	-36	
RENOLIN SE 150		972	290	155	14.9	95	-39	

RENOLIN

Product name	Description	Density at 15 °C kg/m³	Flash point Clev. °C	Kin. visc. at 40 °C mm²/s	Kin. visc. at 100 °C mm²/s	VI	Pour-point °C	Main application area
Gas Compressor Oils								
RENOLIN LPG 100	**Range RENOLIN LPG** 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.
RENOLIN LPG 185		1012	280	185	29.0	197	-36	



notes

Disclaimer:
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 aircrafts / spacecrafts or their components, unless such products are removed before the components are assembled into the aircraft / spacecraft. The information given in this product information represents general, non-binding guidelines. No warranty expressed or implied is given concerning the properties of the product or its suitability for any given application.

We therefore recommend that you consult a FUCHS 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.

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FUCHS Industrial lubricants

Innovative lubricants need experienced application engineers

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

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