

fuchs lubricants An oil for Every Application



FUCHS Refrigeration Lubricants



FUCHS LUBRICANTS

AN EXPERT MANUFACTURER



HOW FUCHS EXCEL...

FUCHS was founded in 1931 as a family firm in Mannheim, Germany, importing high quality refinery products. Now the FUCHS Group is a global corporation, with over 4,000 employees, 80 operating companies and 51 production plants, including the UK.

FUCHS is the largest independent supplier of lubricants in the world and the most popular brand of refrigeration oil in Europe.

FUCHS are committed to developing superior lubrication products and providing unique customer solutions. This is achieved through a continuing program of product innovation and a constant quest for perfection throughout the entire production process.



OF INNOVATIVE LUBRICANTS



WHAT MAKES FUCHS REFRIGERATION OIL SPECIAL?

Refrigeration oil is a critical element in any refrigeration circuit. If you were to consider the role of lubricants across all industrial sectors, refrigeration would surely be considered one of the trickiest to master. The huge variations in temperature, the vast working pressures and the need to mix with unstable refrigerants all pose a significant challenge indeed.



With these obstacles in mind, the R&D experts at FUCHS used their decades of knowledge and immense global resources to create RENISO, a high performance refrigeration oil with superior thermal stability and unbeatable longevity. FUCHS also believe that not only it's quality, but that its suitability will have a resounding effect on the efficiency and lifespan of the oil. This is why FUCHS have developed a complete portfolio of superior lubricants, featuring a selection of products suitable for almost any application.

FUCHS RENISO refrigeration compressor oils are designed for **optimum performance**, regardless of temperature



FUCHS LUBRICANTS **RENISO TRITON SERIES**



POLYOL ESTER (POE)

Fully synthetic refrigeration oils



The refrigeration oils of the RENISO TRITON SE/SEZ series are based on synthetic esters that were especially developed for use with chlorine-free, fluorinated hydrocarbons (HFC/C). In contrast to conventional refrigeration oils, these are miscible and compatible with polar HFC/FC's.



All RENISO TRITON ester oils are ultra dried and filled into vapout tight containers, in a nitrogen atmosphere, ensuring a water content of <50 ppm - keeping any chance of moisture contamination to a minimum.



Recommended Applications	Technical properties	Advantages and Benefits
The RENISO TRITON SE/SEZ series is outstandingly suited for all refrigeration circuits, in which chlorine- free HFC/FC refrigerants, e.g. R134a, R404A or R410A are used. Depending on the viscosity, RENISO TRITON SE/SEZ refrigeration oils are recommended for hermetic, semi- hermetic, open piston, screw-type and turbo-compressors. RENISO TRITON SEZ 22 is especially suitable for deep- freeze systems operating with R23.	Special synthetic polyolester	Stable lubrication film even at high temperatures, outstanding lubricity
	Excellent solubility with HFC and FC refrigerants	Very high thermal and chemical stability in the presence of fluorinated refrigerants
	Good viscosity-temperature behavior	Excellent cold-temperature flowability
	Good compatibility with elastomers and materials normally used in refrigeration circuits	Secure oil return from the system, good heat transfer

Product name	ISO Viscosity mm²/s	Pour point °C	Flash point °C	Water content mg/kg	Colour index DIN ISO 2049	Sizes available Litre	Refrigerants
RENISO TRITON SE 55	55	-51	270	< 50	1.0	1, 5, 20	Chlorine-free
RENISO TRITON SE 170	173	-24	260	< 50	1.0	5, 10, 205	D124A
RENISO TRITON SEZ 22	22	-54	240	< 50	0.5	5	R134A,
RENISO TRITON SEZ 32	32	-48	240	< 50	1.0	5	R404A,
RENISO TRITON SEZ 68	68	-45	258	< 50	0.5	1, 5, 10	R410A etc
RENISO TRITON SEZ 100	100	-39	288	< 50	1.0	5, 10	



RENISO RENISO MS SERIES

ALKYL BENZENE (AB)



The refrigeration oils of the RENISO MS series are based on a blend of special alkyl-benzenes and highly refined naphthenic mineral oils. Extensive wear protection is achieved with a special additive system, so reliable lubrication of highly stressed compressors is ensured.

Anti-wear refrigeration oils



The special solubility and miscibility with CFC/HCFC refrigerants permit the use in low-temperature systems, in heat pumps and in air conditioning systems.



Recommended Applications	Technical properties	Advantages and Benefits
The RENISO MS series is suitable for the lubrication of refrigeration compressors with CFC/HCFC refrigerants according to DIN 51 503 for high temperature / load conditions. Because of good miscibility with the refrigerants R22 and R502, the refrigeration oils of the RENISO MS series are especially recommended for these HCFC refrigerants and as well for chlorine- containing "drop in" refrigerants, e.g. R401 and R402.	Good solubility/miscibility with CFC and HCFC refrigerants, e.g. R22 and R502	Outstanding thermal and chemical stability under extreme operating conditions
	Contains advanced anti-wear additives	Excellent wear protection
	Best suited for transitional refrigerants, e.g. R401A/B, R402A/B and R22 mixtures	High load-carrying capacity

Product name	ISO Viscosity mm²/s	Pour point °C	Flash point °C	Water Content mg/kg	Colour index DIN ISO 2049	Sizes Available Litre	Refrigerants
RENISO MS 32	32	-42	197	25	1.5	205	R22,
RENISO MS 46*	46	-42	202	25	1.5	20	R502,
RENISO MS 68	68	-36	202	25	1.5	205	R401 & R402

FUCHS LUBRICANTS **RENISO S/SP** SERIES



ALKYL BENZENE (AB)

Fully synthetic, alkylbenzene-based refrigeration oils



The RENISO S/SP series are synthetic, alkylbenzene-based refrigeration oils with advanced anti-wear properties for systems with chlorine-containing refrigerants. Sophisticated production processes ensure that the RENISO S/SP products are sulphur and wax-free. RENISO S/SP products were developed for critical applications especially when good anti-wear properties are required.

applications. In general, RENISO S/SP oils are recommended whenever other oils provide insufficient protection against

wear.



Compared to equiviscous, mineral oil-based refrigeration oils, the following improved wear protection values were established:

Four ball scar	RENISO SP 46:	0,3 mm
diameter (1h at 150 N)	Mineral oil:	0,6 mm
Almen-Wieland test	RENISO SP 46: Mineral oil:	

*approved by:

Recommended Applications	Technical properties	Advantages and Benefits		
RENISO SP products are recommended for use in R22 applications – low evaporating temperatures. R22, R502 applications and with drop-in refrigerants i.e. R401A/B, R402A/B. Heat pumps used	Very high thermal stability Excellent ageing and oxidation resistance	Excellent wear protection Good extreme-pressure (EP/AW) properties		
	R22 flocculation point < -60°C	Excellent low-temperature behaviour		
high compressor outlet temperatures are encountered. Systems operating with R600a (iso-butane) and R290 (propane). RENISO S 68 is particularly recommended for R717 (NH3) systems and for R22	Miscibility gap with R22 < -70°C	Excellent oil-refrigerant solubility		

Product name	ISO Viscosity mm²/s	Pour point °C	Flash point °C	Water Content mg/kg	Colour index DIN ISO 2049	Sizes Available Litre	Refrigerants
RENISO S 68	68	-36	188	20	0.5	20, 205	R22, R502, R401,
RENISO SP 46*	46	-42	175	20	0.5	20, 205	R402, R600a, R290
RENISO SP 100	100	-30	206	20	0.5	20, 205	R717/NH3 (S 68 only)

While the information and figures given here are typical of current production and conform to specification, minor variations may occur. Subject to amendment. Edition 06/2009

RENISO

RENISO RC SERIES



MINERAL OIL (MO)



RENISO RC oils is based on selected naphthenic base stocks with very low pour point. They are suitable for small hermetically sealed domestic refrigerator units as well as large industrial units. RENISO RC is manufactured to a strictly controlled minimum moisture content. This is to prevent the formation of ice crystals in the refrigerating

Naphthenic mineral refrigeration oils



systems which can lead to reduced evaporator efficiency. Napthenic refrigeration oils generally display very low pour points, good cold flowing properties and high thermal and chemical stability. Superior thermal and oxidation stability enables operation at high temperatures for long periods without deterioration.

Recommended Applications	Technical properties	Advantages and Benefits
RENISO RC68 is specifically formulated for use in domestic and industrial refrigeration compressors.	Manufactured using highly refined naphthenic base oils	Low pour point properties.
<u>.</u>	Low moisture levels	Improved evaporator efficiency
	Very low pour point and floc point	Low risk of efficiency loss if leakage occurs
	Superior thermal and oxidation stability	Will operate at high temperatures for long periods without deterioration.

Product name	ISO Viscosity mm²/s	Pour point °C	Flash point °C	Water Content mg/kg	Colour index DIN ISO 2049	Sizes Available Litre	Refrigerants
RENISO RC 32	32	-36	162	< 100	1.5	5	R22,
RENISO RC 46	46	-32	170	< 100	1.5	20	R134a,
RENISO RC 68	68	-27	183	< 100	1.5	5, 20	R717

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MINERAL OIL (MO)

Special naphthenic refrigeration oils



RENISO K refrigeraton oils are highly refined, naphthenic selective raffinates that have been dewaxed especially for use at low temperatures. Their degree of refinement ensures that the RENISO K oils are extremely resistant to ageing when combined with any conventional refrigerant especially with ammonia (NH3) and with HCFC(CFC).



RENISO K Series oils all feature excellent flow-ability at low temperatures, ensuring continuous heat transfer and enhanced efficiency.

Recommended Applications	Technical properties	Advantages and Benefits
RENISO KM 32, KS 46, KC 68 is recommended for use with ammonia (R717) and CFC/HCFC systems in open; semi hermetic-and hermetic	Good solubility with fluorochlorinated hydrocarbons (CFC / HCFC)	Excellent flowability at low temperatures ensures continuous heat transfer and enhanced system efficiency
compressors. RENISO KES 100 is recommended for use in CFC / HCFC systems, especially when high evaporation and condensation temperatures can occur, as e.g. in bus and vehicle air conditioning systems.	High chemical and thermal stability with Ammonia (NH3)	Very low water content – dried before packaging

Product name	ISO Viscosity mm²/s	Pour point °C	Flash point °C	Water Content mg/kg	Colour index DIN ISO 2049	Sizes Available Litre	Refrigerants
RENISO KM 32	32	-45	185	25	1.0	20, 200	R22
RENISO KS 46	46	-42	195	25	1.0	20	R717 (EXCEPT KES 100)
RENISO KC 68	68	-39	200	25	1.0	20, 200	
RENISO KES 100	100	-33	200	25	1.5	20, 205	

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RENISO RENISO C SERIES

POLYOL ESTER (POE)

Refrigeration Oil for CO₂ Compressors



RENISO C Series Refrigeration oils are based on special synthetic esters, formulated for use in Carbon Dioxide (CO_2) compressors in all fields of industrial and commercial refrigeration. RENISO C is a versatile oil that can be used in sub as well as trans-critical applications and will ensure optimum wear protection even under

as well as container cooling systems.



arduous CO₂ operating conditions. The RENISO C series offers high thermal and chemical stability, excellent deep-temperature flow-ability and good lubrication at high pressure levels.



Recommended Applications	Technical properties	Advantages and Benefits
RENISO C can be used in almost any application in industrial and commercial refrigeration, e.g. large-scale cooling plants. RENISO C was developed for use mainly in refrigeration systems (deep-	Good solubility/miscibility with CFC and HCFC refrigerants, e.g. R22 and R502	Outstanding thermal and chemical stability under extreme operating conditions
temperature systems (deep- temperature systems, cascades, etc.) which are working with the refrigerant CO2 (R 744). RENISO C 85 E has an excellent solubility / miscibility with CO2 which guarantees the oil circulation in the refrigeration system, especially at low evaporation temperatures. RENISO C can also be used in transcritical CO2 cycles, e.g. air conditioning and heat pump systems,	Best suited for transitional refrigerants, e.g. R401A/B, R402A/B and R22 mixtures	Excellent wear protection
	Low water content	High load-carrying capacity

Product name	ISO Viscosity mm²/s	Pour point °C	Flash point ℃	Water Content mg/kg	Colour index DIN ISO 2049	Sizes Available Litre	Refrigerants
RENISO C 55	55	-48	286	< 30	< 30	5	
RENISO C 85	85	-42	246	< 30	< 30	10	R744
RENISO C 170	170	-40	286	< 30	< 30	10	

FUCHS LUBRICANTS **RENISO SYNTH SERIES**



POLYALPHAOLEFIN OIL (PAO)

Fully synthetic PAO-based refrigeration oil





RENISO SYNTH is based on polyalphaolefins (PAO) with excellent chemical and thermal stability. It was developed especially for applications where ammonia is used as a refrigerant. RENISO SYNTH has a better lifetime compared to mineral oil-based refrigeration oils, lower evaporating losses due to the synthetic components,

and an excellent low temperature flowability. RENISO SYNTH 68 meets and exceeds the requirements of refrigeration oils which are not miscible with ammonia (NH3) – DIN 51 503-1, Category KAA .

Recommended Applications	Technical properties	Advantages and Benefits		
RENISO SYNTH 68 is recommended	High viscosity index	Good viscosity temperature behaviour		
alkylbenzene-based products especially in highly stressed ammonia	Excellent low temperature flowability	Excellent cold flowing properties (especially in evaporators) Extreme chemical and thermal stability with NH3 Good lubricity		
applications and / or for deep evaporating temperatures. RENISO SYNTH 68 can be used in piston as well as in oil-injected screw compressors.	Extremely low pourpoint			
	Low evaporating losses			
	High flashpoint			

Product name	ISO Viscosity mm²/s	Pour point °C	Flash point °C	Water Content mg/kg	Colour index DIN ISO 2049	Sizes Available Litre	Refrigerants
RENISO SYNTH 68	68	-57	260	30	0.5	20, 200	R717



CENT

LUBRICANT & SYSTEM CONDITION MONITORING

CENT Condition Monitoring has been successfully operating in a variety of industries for over 25 years. This predictive monitoring system uses oil-wear, debris and vibration analysis to track trends in lubricant condition. CENT analyst's will also attempt to identify the causes of problems in the oil, providing the user with an earlywarning-system of potential machine failure.

The procedure for preventative maintenance via oil analysis is simple: Samples are taken using FUCHS CENT sampling kit and are then sent to the FUCHS CENT labs for analysis. FUCHS test the sample and report to the customer within 72 hours of receipt, outlining the condition and recommending any remedial action.

Customers are advised via an easily digestible report, highlighting important trends and figures (pictured right). A traffic light symbol is used to demonstrate if any action is required. By performing regular scheduled tests, CENT condition monitoring is an ideal way to track a systems performance over time.

The CENT sampling kit can be used with any refrigeration oil on any system. It is available from all good HVAC wholesalers and the cost of testing and reporting is included in the price of the kit.







EASY TO USE LOW COST - PAY FOR KIT ONLY CRITICAL TRENDS PLOTTED COMPREHENSIVE RESULTS AVAILABLE ELECTRONICALLY

Distributing **Exceptional** products... ...Requires an **Exceptional** Partnership

Your national UK distributor for the only complete range of refrigeration lubricants is Advanced Engineering, a company with decades of experience in the ACR sector. Knowledgeable Advanced staff are always on hand to provide useful help and guidance. From a brief technical query over the phone, through to on-site technical consultations and beyond, Advanced Engineering will always ensure you have the right lubricant solution.

Advanced Engineering provide:

- Free technical consultation
- Unlimited telephone support
- Access to the CENT oil analysis service
- A commitment to stock availability

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Your Fuchs Lubricants specialists Advanced Engineering, are Europe's leading manufacturer of coil cleaning products & distribute several other leading ACR brands.

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Fuchs Lubricants follows a policy of continual product improvement. For this reason, some materials and specifications could change without notice. The most suitable lubricant should be selected after consulting the equipment manufacturer, manufacturers of ancillary machinery and lubricant manufacturer. A comprehensive consultation should precede any lubricant change, so that the optimal lubricant can be selected for the appropriate application.