

RENISO PAG 1234

Universal refrigeration oil for HFO-1234yf and R134a mobile air conditioning (MAC) systems

Based on special polyalkylene glycols (PAG) with enhanced refrigerant miscibility behaviour. Contains special additives for increased chemical stability and wear protection.

Description

Due to the actual EU legislation it is necessary to use low GWP refrigerants in car air conditioning systems. One option is the refrigerant HFO-1234yf. RENISO PAG 1234 is an ISO VG 46 refrigeration oil which was developed for the use with both refrigerants HFO-1234yf and R134a.

RENISO PAG 1234 is based on special double-endcapped polyalkylene glycols (PAG) and contains a high-performance additive system in order to cope with the special requirements in the air conditioning system.

Especially the chemical stability in combination with the new refrigerant HFO-1234yf was optimized by choosing a new additive technology for RENISO PAG 1234. Also the refrigerant miscibility of RENISO PAG 1234 is favourable: a safe oil transport is guaranteed, no matter if R134a or HFO-1234yf is used as refrigerant.

Application

RENISO PAG 1234 is a synthetic refrigeration oil for car air conditioning systems with fluorinated refrigerants. It is suitable for both HFO-1234yf and R134a.

RENISO PAG 1234 shows excellent wear protection in all common compressor types, especially axial piston compressors. Effective antiwear (AW) additives combined with the special double-endcapped PAG base fluid secure outstanding lubrication properties.

RENISO PAG 1234 also fulfills highest requirements with regard to the thermo-chemical stability in HFO-1234yf cycles. A selective new

Advantages

- Outstanding chemical stability in combination with both HFO-1234yf and R134a
- Very high thermal stability
- Excellent miscibility and compatibility with HFO-1234yf and R134a
- Excellent viscosity-temperature behaviour (high VI)
- Low viscosity at low temperature, good flowability
- Stable lubricating film at high temperatures
- Good compatibility with all materials commonly used in refrigeration systems
- RENISO PAG 1234 is ultra-dried

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Application (continued)

additive blend is taking care for the higher reactivity of HFO type refrigerants. Thus a long oil lifetime together with HFO-1234yf can be secured – a lifetime as long as known from common R134a A/C systems.

PAG based lubricants like RENISO PAG 1234 are hygroscopic. Due to their polar chemical structure they tend to absorb humidity from ambient air.

This means that special care must be taken when handling such products (always keep containers tightly sealed, use nitrogen to cover the refrigeration oil and store containers in dry places).

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Typical technical data:

Properties	Unit	RENISO PAG 1234	Test method
Density at 15 °C	kg/m ³	993	DIN 51757
Kinematic viscosity at 40 °C	mm ² /s	44	DIN EN ISO 3104
at 100 °C	mm ² /s	9.8	
Viscosity index (VI)	-	218	DIN ISO 2909
Neutralisation number	mgKOH/g	0.02	DIN 51558-1
Flashpoint, COC	°C	224	DIN ISO 2592
Pourpoint	°C	-45	DIN ISO 3016
Water content	ppm	300	DIN 51777-2
Sealed tube test (336 h / 175 °C / Fe + Cu + Al strip added)			ASHRAE 97- 2007
TAN after testing	mgKOH/g	< 0.2	
appearance oil after testing	-	only minimal discoloration	
appearance Fe strip after testing	-	no change, no deposits	
appearance Cu strip after testing	-	no change, no deposits	
appearance Al strip after testing	-	no change, no deposits	

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Thermal and chemical stability:

Sealed Tube Test of RENISO PAG 1234 / HFO-1234yf mixtures (ASHRAE 97-2007)

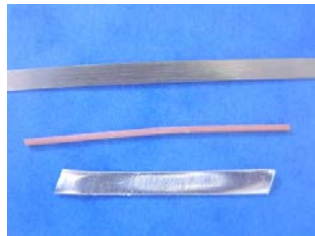
Test conditions:

336 h / 175°C / Fe + Cu + Al strip added

Test results:



Oil / refrigerant mixture:
→ only minimal discoloration



Metal coupons:
→ no deposits

Before testing

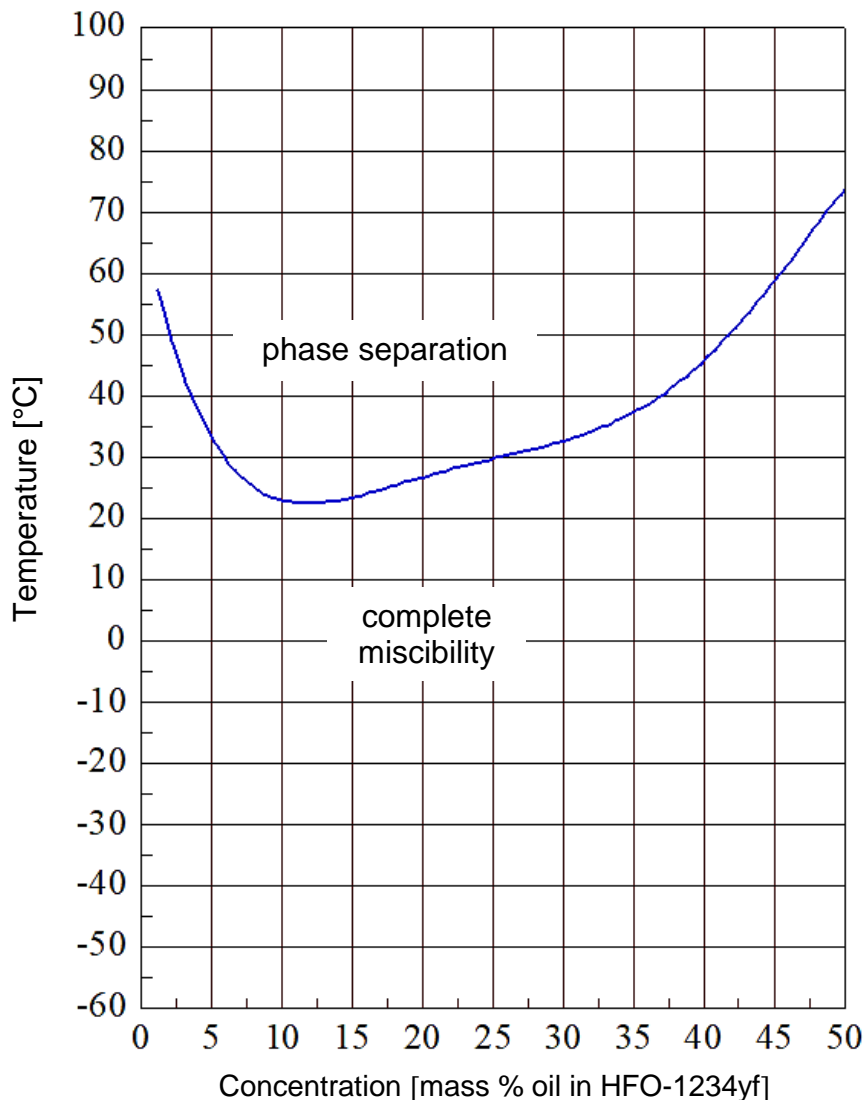
After testing

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Miscibility behaviour (miscibility gap): RENISO PAG 1234 and HFO-R1234yf mixtures

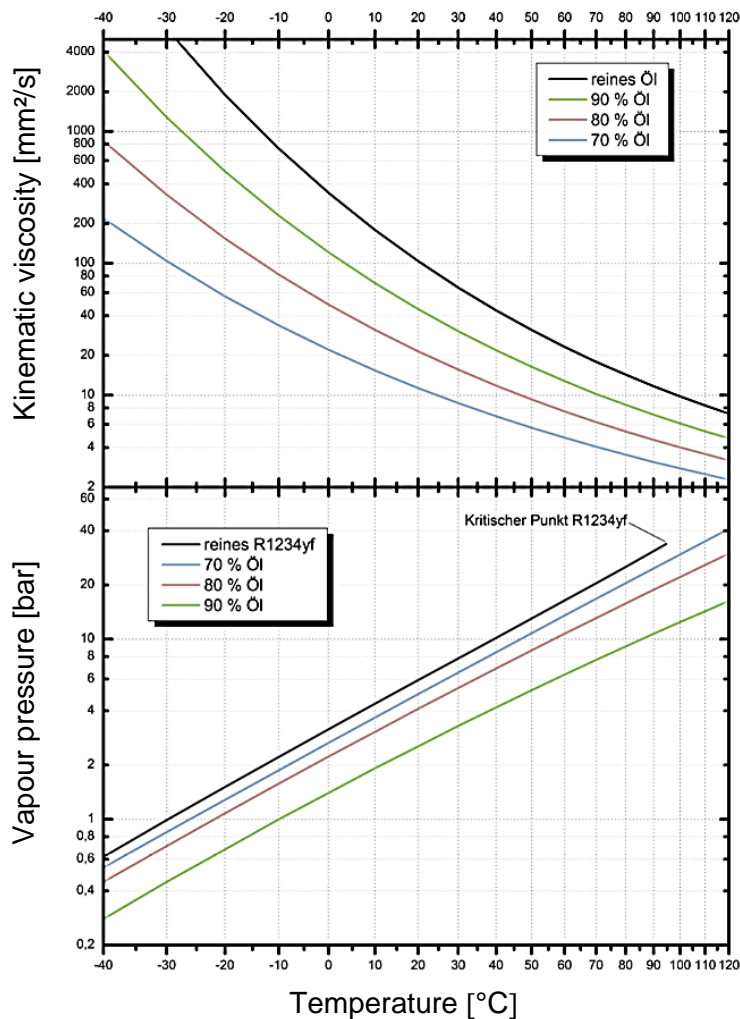


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Kinematic viscosity and vapour pressure: RENISO PAG 1234 and R1234yf



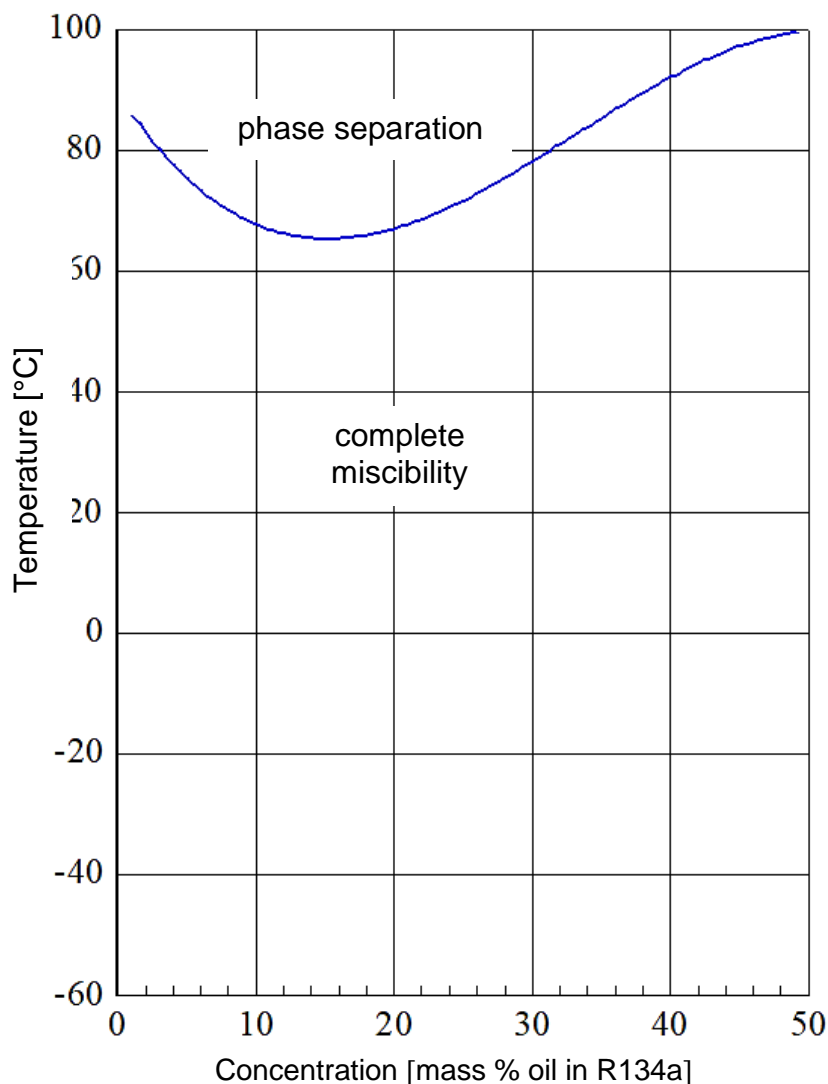
All % figures represent mass % oil in the refrigerant/oil mixture.

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Miscibility behaviour (miscibility gap): RENISO PAG 1234 and R134a



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