

## 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**





## 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.**

#### 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).

## 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.

#### Typical technical data:

Properties	Unit		Test method
Density at 15 °C	kg/m <sup>3</sup>	993	DIN 51757
Kinematic viscosity at 40 °C at 100 °C	mm <sup>2</sup> /s mm <sup>2</sup> /s	44 9.8	DIN EN ISO 3104
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	

## 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.

Thermal and chemical stability:

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

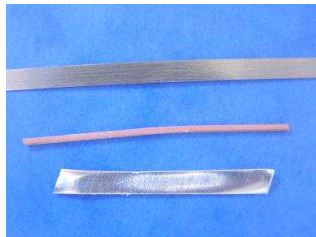
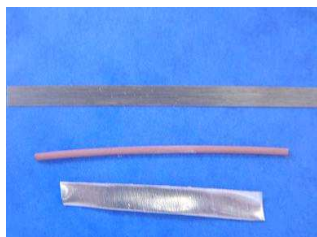
Test conditions:

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

Test results:



Oil / refrigerant mixture:  
→ only minimal discoloration



Metal coupons:  
→ no deposits

Before testing

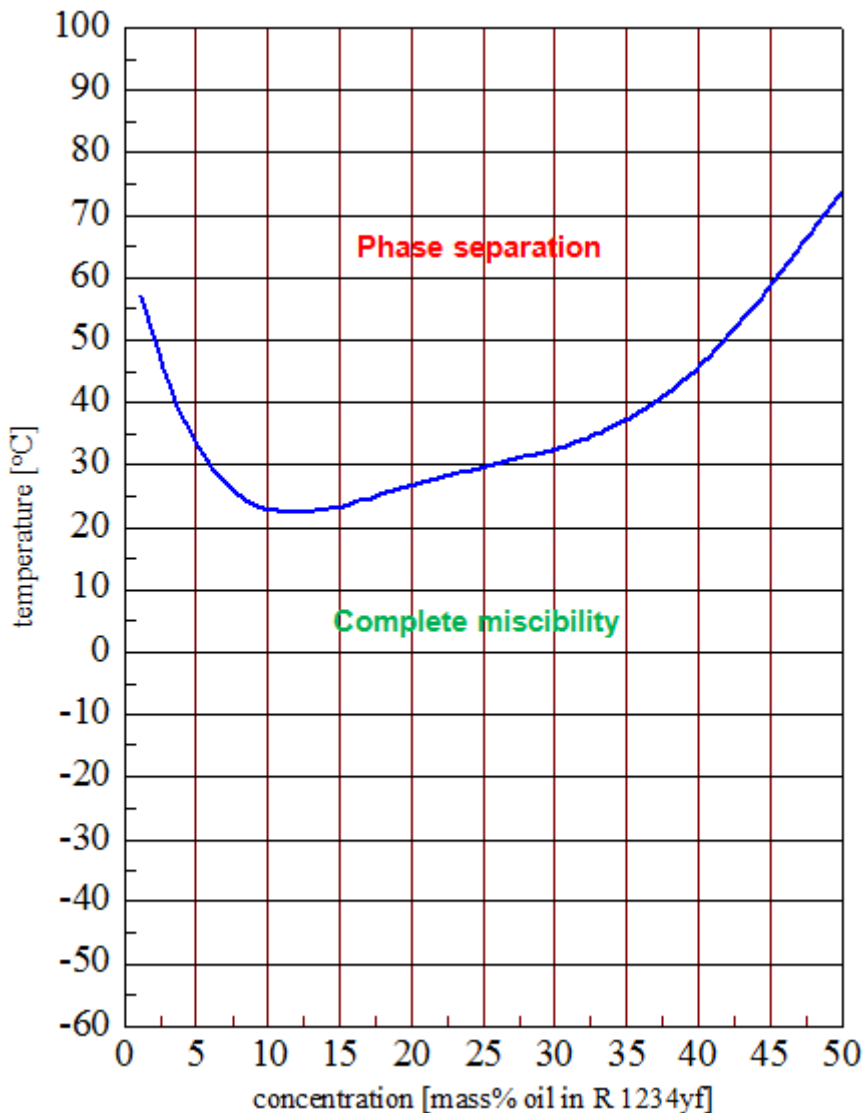
After testing

## 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.

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

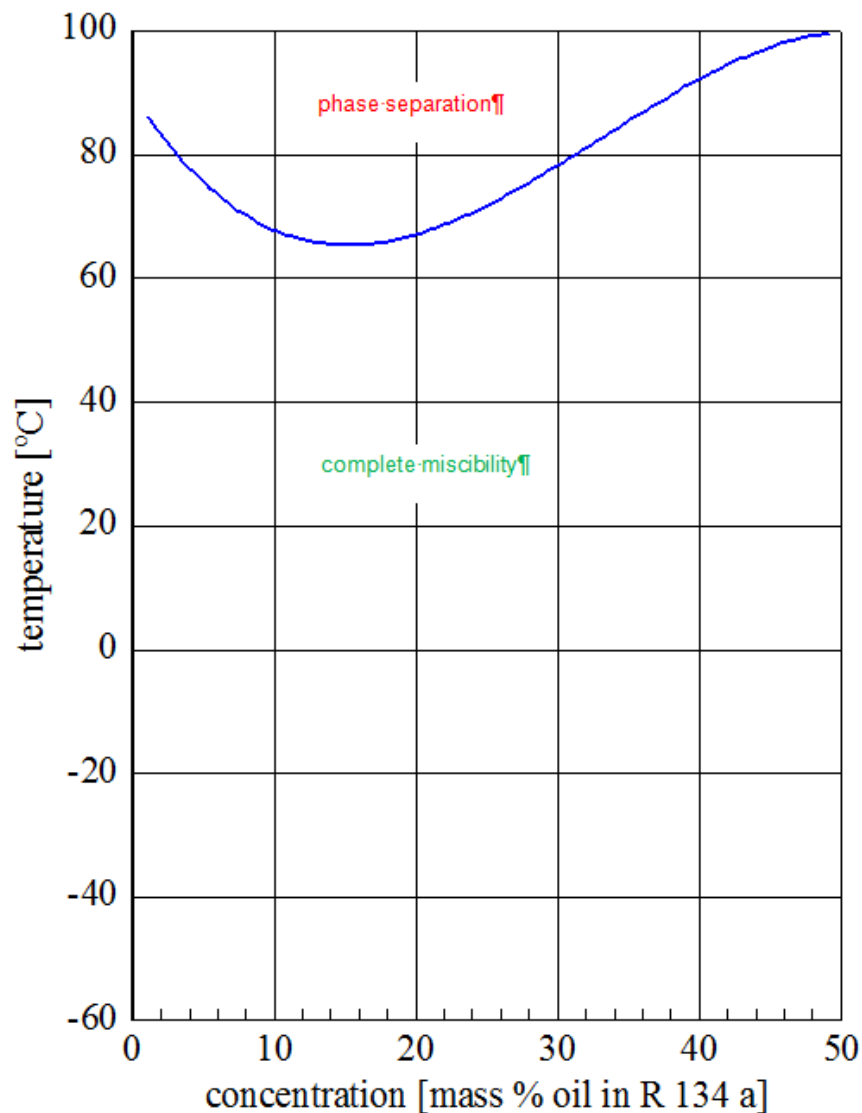


## RENISO PAG 1234

### 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.

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





## 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.**

The information contained in this product information is based on the experience and know-how of FUCHS EUROPE 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. 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 EUROPE 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 EUROPE SCHMIERSTOFFE GMBH.

© FUCHS EUROPE SCHMIERSTOFFE GMBH. All rights reserved.