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# Plurasafe<sup>®</sup> RLA-X

## Synthetic high performance PAG lubricant for CO<sub>2</sub> based air conditioning and refrigeration systems

### Description

Plurasafe RLA-X is a synthetic high performance novel polyalkylene glycol lubricant.

A typical polyalkylene glycol generally consists of polymer chains with a terminating hydroxyl group at one end which is chemically active, whereas a “capped” PAG has chemically inactive groups at both ends of the molecule.

### Application

Plurasafe RLA-X lubricant, based on “capped PAG” technology, provide efficient lubrication for compression type refrigeration units and improved lubricating properties. High process efficiency typically results in ~ 95 % capping for the Plurasafe RLA-X range.

Plurasafe RLA-X demonstrates extensive miscibility with a wide range of HFC's and CO<sub>2</sub> based air conditioning and refrigeration systems. It also shows a suitable compatibility with other refrigerants as hydrocarbons and ammonia.

The majority of conventional lubricants such as mineral oils and alkylbenzenes are not soluble with CO<sub>2</sub>. Polyol ester (POE) synthetic lubricants show very good miscibility properties, however this can result in a dramatic reduction in viscosity in the refrigerant condenser. PAGs show partial miscibility with CO<sub>2</sub>, however the viscometric properties of polyalkylene glycols remain unaffected and the decrease in viscosity observed with POEs is not observed for PAGs under CO<sub>2</sub> dilution.

### Features and benefits

Performance advantages characterising the Plurasafe RLA-X range include:

- Miscibility with different refrigerants as HFC's, CO<sub>2</sub>, hydrocarbons and ammonia.
- Reduced hygroscopicity compared with water absorbing tendency of uncapped PAGs.
- High chemical, thermal and hydrolytic stability.
- Excellent lubricity.

## Typical properties

Property	RLA 46-X	RLA 68-X	RLA 100-X	RLA 150-X	Method
Viscosity 40 °C (cSt)	49.7	78.9	107.3	153.6	ASTM D445
Viscosity 100 °C (cSt)	10.7	15.7	20.0	27.7	ASTM D445
Viscosity index	213	213	216	220	–
Density (g/cm <sup>-3</sup> at 20 °C)	0.998	0.998	0.999	0.998	ASTM D1298
Pourpoint (°C)	–49	–46	–43	–37	ASTM D97
Flashpoint COC (°C)	>200	>200	>200	>200	ASTM D92
Water content (%mass)	<0.05	<0.05	<0.05	<0.05	ASTM E284
TAN (mgKOH/g)	<0.10	<0.10	<0.10	<0.10	ASTM D974
4-Ball wear scar –40 kg/1 hr (mm)	0.53	0.52	0.58	0.58	ASTM D4172
Cu corrosion test	1a	1a	1a	1a	ASTM D130
Steam turbine corrosion test	Pass	Pass	Pass	Pass	ASTM D665 A

### Miscibility in CO<sub>2</sub>

Upper CST:					
1 % RLA-X in CO <sub>2</sub>	30.9	–	30.9	–	ASHRAE 86
5 % RLA-X in CO <sub>2</sub>	30.9	–	30.9	–	
30 % RLA-X in CO <sub>2</sub>	26.0	–	27.0	–	
50 % RLA-X in CO <sub>2</sub>	13.0	–	16.0	–	
Density inversion temp:					
1 % RLA-X in CO <sub>2</sub>	–31.0	–	–32.0	–	
5 % RLA-X in CO <sub>2</sub>	–31.0	–	–32.0	–	
30 % RLA-X in CO <sub>2</sub>	–31.0	–	–32.0	–	
50 % RLA-X in CO <sub>2</sub>	–29.2	–	–31.0	–	

## Storage stability

The product in original package can be stored for max. 5 years at ambient storage conditions and temperature without any deterioration.

## Safety

When using this product, the information and advice given in our Safety Data Sheet should be observed. Due attention should also be given to the precautions necessary for handling chemicals.

## Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

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