

# BREOX MAC RANGE

## INTRODUCTION

Hydrofluorocarbon (HFC) refrigerants are commonly used worldwide as a more environmentally acceptable to CFCs, which demonstrate ozone depletion potential (ODP). Poor compatibility is observed between HFCs and mineral oil based lubricant systems and as a result the use of synthetic lubricants is well established. Almost all new mobile airconditioning systems are filled with R-134a and lubricated with polyalkylene glycol lubricants. Synthetic polyalkylene glycol (PAG) lubricants demonstrate excellent lubricity and good solubility with refrigerant HFC R-134a.

**BREOX MAC Grades** are fully formulated ISO grade polyalkylene glycol lubricants designed specifically for application with R-134a in mobile air-conditioning systems. **BREOX MAC Grades** are designed for application in A/C systems where the compressor requires a lubricant with viscosity of 46 - 150 cSt @ 40°C.

## RETROFITTING

**BREOX MAC Grades** are suitable for applications where older vehicles using the R12/mineral oil combination are being retrofitted from CFC R12 to HFC R-134a. **BREOX Mac Grades** demonstrate excellent solubility with R-12, are stable in the presence of residual levels of R-12 and are also miscible and stable with residual levels of mineral oil.

## PRODUCT HANDLING

Polyalkylene Glycols are hygroscopic relative to other synthetic lubricants and mineral oils, however the presence of low levels of water in polyalkylene glycols cannot result in chemical instability or problems such as ice formation or metal surface corrosion. Excessive water absorption of a polyalkylene glycol may however be prevented by minimising the product's exposure to air.

A low water content specification of 0.03% max is defined for **BREOX MAC Grades**. Correct handling of the product consists of storing bulk volumes in nitrogen blanketed vessels (or equipping them with vent driers), handling of small volumes requires simply ensuring that the container is closed when not in use and that time spent transferring product to the compressor system is minimised.

## PAG ADVANTAGES

- Excellent Solubility in HFC R-134a, and alternative HFCs.
- Superior lubricity compared to alternative synthetic technologies and mineral oils. Improved wear protection can result in improved system efficiency, lower maintenance costs and reduced downtime.
- Exceptional Viscosity Index – The high VI of **BREOX MAC Grades** enhances compressor life by ensuring efficient running at temperature extremes, the high Viscosity Index may also allow the user to select a lower viscosity fluid than typically used, with associated power usage savings.
- Good high temperature stability, resulting in reduced downtime and lower maintenance costs.
- Formulating Expertise – The **BREOX MAC Grades** contain efficient additive technology to protect the compressor from any problems related to corrosion of white or yellow metals, to minimise the effects of wear and extreme pressure conditions and to ensure long fluid life.

## TYPICAL PROPERTIES

Performance Attribute	Analysis Method	MAC 46	MAC 100	MAC 150
Viscosity @40°C (cSt)	ASTM D445	42	101.2	150
Viscosity @100°C (cSt)	ASTM D445	8.3	18.1	25.8
Viscosity Index	ASTM D2270	178	198	208
Density (gcm <sup>-3</sup> )	ASTM D1298	0.983	0.993	0.996
Flash Point (°C)	ASTM D92	242	246	252
Pour Point (°C)	ASTMD97	-50	-46	-43
Water Content (wt% max)	ASTM E284	0.03	0.03	0.03
TAN (mgKOHg <sup>-1</sup> )	ASTM D974	0.10	0.10	0.10

(The typical values presented here should not be considered to constitute a specification).

## Remarks

### Handling & Safety:

A material Safety Data Sheet (MSDS) has been issued describing the health, safety and environmental characteristics of BREOX MAC Grades together with handling precautions and emergency procedures. This must be consulted and fully understood before storage, handling and use.

### Storage:

## Revision-No.

2.4-02.2005 Effective February 21, 2005

The product can be stored for at least 2 years at ambient storage conditions and temperature without any deterioration.

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