


## BVA RPOE LUBRICANTS

Property	22cc	32	LT-32	32MA	46	68	100	120	170	220
Visc @ 40° C cSt	22.55	31.96	29.15	31.96	50.5	64	100	124.9	175.2	215.9
Visc @ 100° C cSt	4.95	5.63	5.91	5.63	7	8.9	12.7	13.7	16.5	20.8
Visc @ 100° F SUS	115	164	149	164	261	329	514	65.1	883	1033
Visc @ 210° F SUS	42.4	45.9	46	45.9	49.4	55.8	69.8	74	85.3	117.2
Viscosity Index	149	106	153	106	94	114	120	106	93	113
Density, lb/gal	8.23	7.79	8.04	7.79	7.71	7.88	7.83	7.83	7.85	7.92
Pour Point°C	-54	-45	-52	-45	-45	-43	-36	-27	-27	-25
Flash Point°C	232	235	243	235	248	266	254	262	271	271
Fire Point °C	260	260	260	260	260	260	260	260	260	318
Density @20°C	0.987	0.942	0.965	0.942	0.937	0.957	0.974	0.94	0.953	0.955

All products are available in gallon, 5 gallon and 55 gallon drums. RPOE LT 32, 68 & 100 are also available in 1 quart containers. RPOE 68 and RPOE 100 are also available in 250 ml containers.



## BVA POE SERIES APPLICATION GUIDE

	Residential Air-Conditioning			Industrial & Commercial Refrigeration & Air-Conditioning			
	Recip.	Rotary	Scroll	Centr.	Recip.	Screw	Scroll
RPOE 22cc	✓				✓		
RPOE 32	✓	✓	✓	✓	✓		
RPOE LT 32	✓	✓	✓	✓	✓		
RPOE 32 MA	✓	✓	✓	✓	✓	✓	
RPOE 68	✓	✓	✓	✓	✓	✓	✓
RPOE 100						✓	
RPOE 120						✓	
RPOE 170						✓	
RPOE 220						✓	

## MOISTURE AND PACKAGING

Polyol esters are generally 10 times more hygroscopic than mineral oil and alkylbenzene. To be "hygroscopic" describes a lubricant's tendency to absorb moisture from air. Polyol esters will absorb up to 0.2 % moisture or 2,000 PPM while mineral oils absorb up to 200 PPM. To ensure moisture is kept to a minimum, BVA has a unique way of packaging the POE Series using a nitrogen purge which leaves a nitrogen blanket over the lubricant to help ensure it remains dry. Over a period of time moisture can migrate through plastic and the lubricant will pick it up. BVA packages the POE Series in metal containers.

# RPOE SERIES OF LUBRICANTS



BVA offers one of the most complete lines of refrigeration lubricants in the world. When packaging BVA's refrigeration lubricants, a nitrogen purge and a nitrogen blanket is used in production to ensure the finished product is one of the driest in the industry.

BVA has been offering refrigeration grade polyol ester lubricants since the mid 1980's. RPOE's are a popular choice for HFC's and the interim blends. Specially formulated POE's are used with CO2 and certain hydrocarbon refrigerants.

RPOE's are most often used with HFC refrigerants because of their improved miscibility. Miscibility and solubility between the refrigerant and lubricant determines how the two will behave throughout the system. Miscibility is defined as the ability of two liquids to mix together to form a single liquid phase. Solubility is the ability of a gas to dissolve into a liquid.

There are three types of miscibility. Complete miscibility is where the refrigerant and oil mix to form a single phase over the applied temperature range. Partial miscibility is a single phase over a limited temperature range. The temperature at which the lubricant and the refrigerant separate into two phases is called the critical solution temperature (CST). Immiscibility is when the oil and refrigerant do not mix and stay in two phases.

The BVA RPOE Series offers excellent miscibility with HFC refrigerants. The BVA RPOE Series has excellent chemical and thermal stability. It also offers superior lubricity characteristics on steel and aluminum.

To ensure that BVA has the right polyol ester for your application, the BVA POE Series comes in a wide range of viscosities ranging from ISO 22 (RPOE 22) to an ISO 220 (RPOE 220).

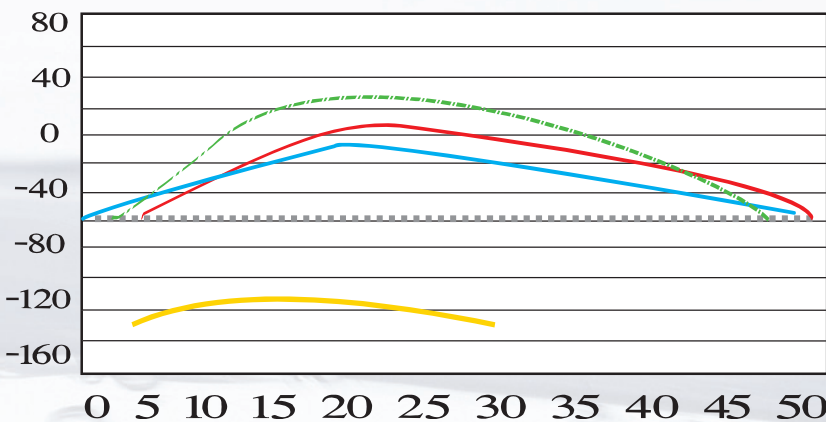
BVA RPOE Series comes with a non intrusive additive package which is suitable for most applications. BVA RPOE EP & AW is a polyol ester with a specially formulated extreme pressure additive & anti-wear package for aluminum, bronze and steel. BVA RPOE NA is a non additized version for unique applications requiring no additives.

BVA can specially formulate polyol esters to meet specific requirements.

## Miscibility Examples

Complete	R-12(CFC) / BVA 3 (MO) R-134a (HFC) and RPOE 68 (POE)
Partial	R-22 (HCFC) / BVA 4 (MO) R-134A (HFC) / RPOE 68 (POE).
Immiscible	R-134A (HFC) / BVA 3 (MO).

## RPOE MISCIBILITY WITH 134a



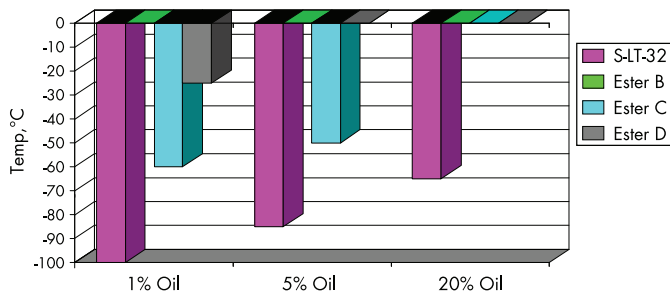
BVA RPOE Series is miscible with all HFC, HCFC, CFC and blends. The series was specifically developed for HFC refrigerants. If you plan to use BVA RPOE with a CFC for an extended period of time, please contact BVA OILS to get the correct viscosity recommendation. BVA RPOE Series is available in 16 oz., 32 oz., 1 gallon, 5 gallon and 55 gallon containers. BVA RPOE EP and NA are made to order.

## BVA RPOE LT 32

# THE COOL CHOICE

Different manufacturers of POEs use different building blocks and additive packages. Miscibility characteristics of the same ISO grade can range from immiscible with one manufacturer to completely miscible with another.

### Miscibility Characteristics R-23



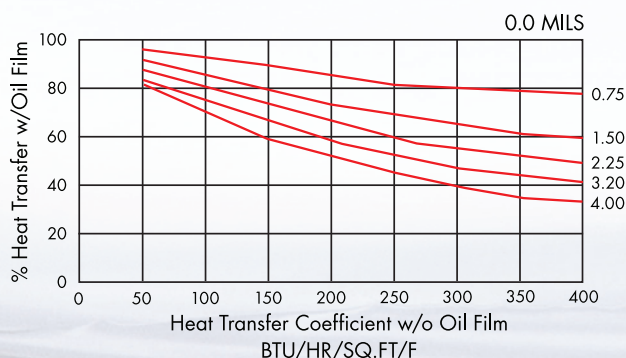
As the graph shows not all ISO 32 POEs are created equal. RPOE LT 32 offers the best low temperature properties available today. When partially miscible lubricants enter the evaporator, the lubricant and refrigerant will separate into two distinct phases, when the temperature falls below the critical solution temperature.

The lubricant, no longer diluted by the refrigerant, will have a dramatic increase in viscosity. If the temperature is low enough the oil will no longer flow.

BVA RPOE LT 32 is a polyol ester that was specifically developed for low temperature systems. It is miscible with R-23 to -115 °F.

When it comes to making a choice about lubricants for low temperature systems, BVA RPOE LT 32 should be your only choice.

### Influence of Oil Film



## SUMMARY OF POPULAR RPOE PRODUCTS

### RPOE 22cc

Specifically designed for use in Copeland compressors using HFC refrigerants. This is equivalent to Mobil EAL 22cc

### RPOE 32

An excellent all purpose ISO 32 POE developed for use in medium temperature applications.

### RPOE 32MA

Specifically designed for use in Copeland compressors using HFC refrigerants. This replaces RPOE- 32LC and Copeland's 32CF formulation

### RPOE LT 32

Specifically designed for low temperature applications. Excellent miscibility with R 23 and Suva® 95 (R-508B). Also good miscibility with R-404A eliminates the need to use two lubricants in a cascade system. This product is patented and has several domestic and international OEM approvals.

### RPOE 68

Designed for use in refrigeration and air conditioning applications requiring an ISO 68 viscosity. This product is patented and has several domestic and international OEM approvals.

### RPOE 100

Designed for applications requiring an ISO 100. Good miscibility will ensure proper oil return in screw applications. This product is patented and has several domestic and international OEM approvals.

### RPOE 120

A common choice for screw compressors where a slightly higher viscosity is required.

### RPOE 170

Approved for use in Bitzer screw compressors. This product offers excellent lubricity at high temperatures and ensures good oil return.

### RPOE 220

A very specialized RPOE developed for applications where high dilution is needed. Primarily used in large screw applications using R-134a.