

LUBRICANTS FOR THE REFRIGERATION



&

AIR CONDITIONING INDUSTRY



BVA OILS

ABOUT BVA OILS

Before describing BVA products and services, I would like to talk about the BVA OILS company. I started BVA in 1983 because I recognized a need for an efficient, independent and knowledgeable source of high quality specialty oil products. Over thirty years experience representing a major oil company and working with OEM and service industry users of speciality oils convinced me of this. As a result, we have developed an organization with over 70 years plus of technical and sales experience.

BVA OILS is a specialty marketing and development company. We are small enough to be responsive to customer needs, yet large enough to guarantee on-time shipment of quality bulk and packaged products. BVA products are principally directed to the refrigeration, auto a/c, mosquito control and agricultural industries including formulating product for users of specialized oil products. BVA products are available in a variety of sizes ranging from 250 ml conetop cans to bulk rail cars.

The products described in this catalogue are available for the refrigeration/air-conditioning industry and auto a/c. In addition, BVA offers a quick response oil test service for a nominal fee.

At BVA we offer experience, quality products, and, most important, a sincere concern that our customers needs are being satisfied. Give us a try and see for yourself.

Bob Vincent, CEO

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BVA POE SERIES OF LUBRICANTS

BVA Oils has been in business for over 23 years and all products are sold under our own label except the polyol ester lubricants. On December 1 BVA decided to Market POE's under our own brand BVA RPOE.

As with all of the refrigeration lubricants we only purchase oils that are OEM approved. As with all of our refrigerant lubricants BVA packages with driers and a nitrogen purge to ensure the finished product arrives as dry as possible

After the Montreal Protocol several new classes of refrigerants such as HFCs, PFCs and interim blends of HFCs and HCFCs were developed. Mineral oils and alkylbenzenes were ineffective with the new refrigerants. Synthetic lubricants such as polyol esters (POE) and polyalkylene glycols (PAG) were found to work effectively. The primary difference with these new lubricants is that they are miscible with the new refrigerants.

Miscibility and solubility between the refrigerant and lubricant determine 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. Completely miscible is where the refrigerant and oil mix to form a single phase over the applied temperature range. Partially miscible 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). Immiscible is when the oil and refrigerant do not mix and stay in two phases.



Miscibility Examples

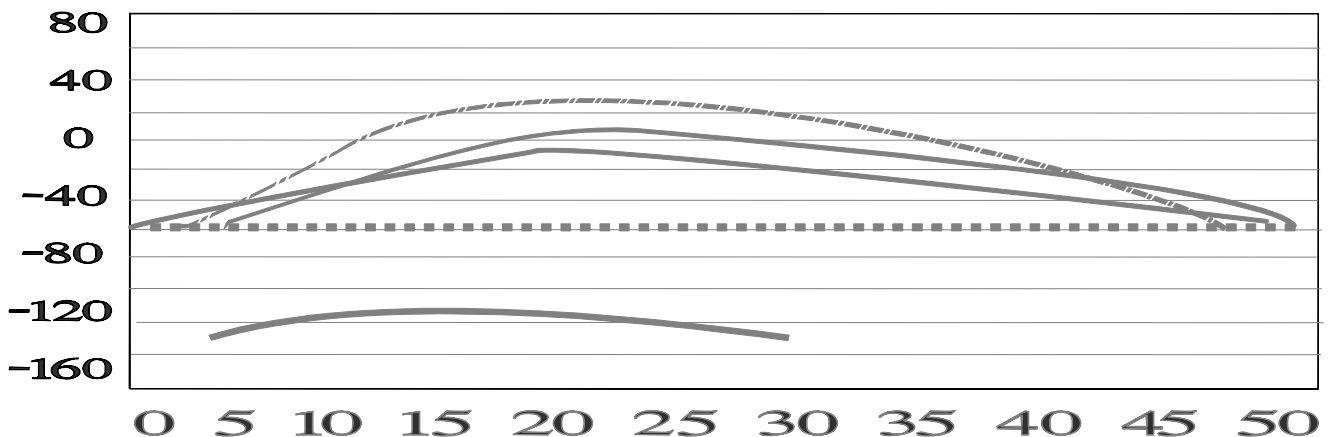
Complete	R-12(CFC) / BVA 3 (MO) R-134a (HFC) and RPOE LT 32 (POE)
Partial	R-22 (HCFC) / BVA 4 (MO) R-134A (HFC) / RPOE 68 (POE).
Immiscible	Suva R-134A (HFC) / BVA 3 (MO).

The BVA RPOE Series offers excellent miscibility with HFC refrigerants. It also has excellent chemical and thermal stability, as well as, 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 is a polyol ester with a specially formulated extreme pressure additive for aluminum, bronze and steel. If your application requires an additive free RPOE then RPOE NA would be your choice.

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 decide to use BVA RPOE with CFC for an extended period of time, please contact BVA OILS

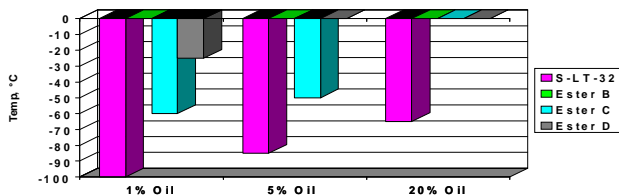
to get the correct viscosity recommendation. BVA RPOE Series is available in 16 oz., 32 oz., 1 gallon, 5 gallon and 55 gallon containers. BVA RPOE EP and NA are made to order.

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.

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.

Miscibility Characteristics
R - 23

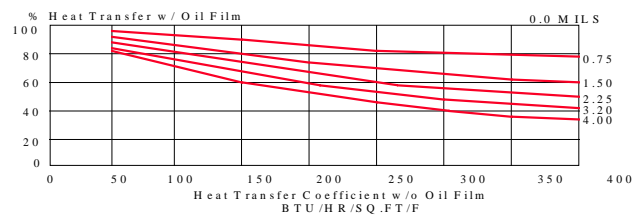


As the graph shows not all ISO 32 POEs are created equal. RPOE LT 32 offers the best low temperature properties available today. In the evaporator with partially miscible lubricants, when the temperature falls below the critical solution temperature, the lubricant and refrigerant will separate into two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

BVA RPOE LT 32 is a polyol ester that was specifically developed for low temperature systems. It is miscible with HFC 134a 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 32 - A good all purpose ISO 32 developed for use in medium temperature applications.

RPOE 22cc

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

RPOE 32_{TC} - Developed for use in Tecumseh compressors. OEM approved by Tecumseh compressors.

RPOE LT 32 - Specifically designed for low temperature. Excellent miscibility with R-23 and Suva 95 (R-508B). Also good miscibility with R-404A eliminates the need for using two lubricants in a cascade system. Multiple OEM approvals domestically and internationally.

RPOE 68 - Designed for use in refrigeration and air conditioning applications requiring an ISO 68 viscosity. Multiple OEM approvals domestically and internationally.

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

RPOE 170 - Approved for use in Bitzer screw compressors. This product offers excellent lubricity at high temperatures and ensures good oil return. OEM approved by Bitzer screw.

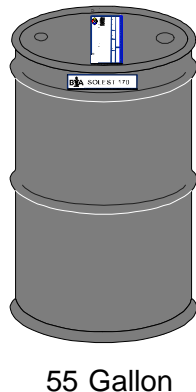
RPOE 220 - A highly specialized RPOE developed for applications where high dilution is needed. Primarily used in large screw applications using R-134a.

BVA RPOE LUBRICANTS							
Property	LT-32	32	46	68	100	170	220
Viscosity,cSt @ 40°C	29.15	31.96	50.50	64.00	100.00	175.20	215.90
@100°C	5.91	5.63	7.00	8.90	12.70	16.50	20.80
Viscosity,SUS@100°	149	164	261	329	514	883	1033
@210°F	46.0	45.9	49.4	55.8	69.8	85.3	117.2
Viscosity Index	153	106	94	114	120.00	93	113
Density, lb/gal	8.04	7.79	7.71	7.88	7.83	7.85	7.92
Pour Point°C(°F)	-52(-62)	-45(-49)	-45(-49)	-43(-45)	-36(-33)	-27(-17)	-25(-13)
Flash Point°C(°F)	243(470)	235(455)	248(480)	266(511)	254(490)	271(520)	271(520)
Fire Point °C(°F)	254(490)	260(500)	276(530)	296(565)	287(550)	301(575)	318(605)
Densitv (g/ml) @							



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

BVA POE SERIES APPLICATION GUIDE							
	Residential Air-conditioning			Industrial & Commercial Refrigeration & Air-conditioning			
	Recip.	Rotary	Scroll	Centr.	Recip.	Screw	Scroll
RPOE 32	✓	✓	✓	✓	✓		
RPOE LT 32	✓	✓	✓	✓	✓	✓	
RPOE 68		✓		✓	✓	✓	✓
RPOE 100				✓		✓	✓
RPOE 170				✓		✓	✓
RPOE 220				✓		✓	✓



MOISTURE & PACKAGING

Polyol esters are about 10 times more hygroscopic than mineral oil and alkylbenzene. Hygroscopic is defined as a lubricant's ability to absorb moisture from air. Polyol esters can absorb up to 0.2 % moisture or 2,000 PPM while mineral oils will absorb up to 200 PPM. To ensure keeping moisture to a minimum BVA has a unique way of packaging the POE Series using a nitrogen purge which will leave a nitrogen blanket over the lubricant to help ensure it remains dry. Over a period of time moisture will migrate across plastic and the lubricant can pick it up. BVA packages the POE Series using metal containers

BVA SPECIALITY LUBRICANTS

BVA CASCADE 2000

BVA CASCADE 2000 is a specially formulated semi-synthetic designed for use with HFC refrigerants. Cascade 2000 is immiscible with R-134A but is designed to give excellent lubricity.

With over 700 units in the field using various refrigerants and types of compressors, we have had no failures or logging problems due to lubrication with CASCADE 2000. It has been put in all types of compressors and equipment from small air conditioners and refrigerators to walk-in coolers and freezers, blast freezers, centrifugals and freeze dryer equipment. Cascade 2000 also makes an excellent alternative for medium temperature systems.

Ordering Information

C2000G or 13771	1 gallon
C2000P or 13772	5 gallon pail
C2000D or 13773	55 gallon drum

BVA 717P-68

BVA 717P-68 is a specially designed lubricant for use in ammonia refrigeration systems. It is a highly stable fluid, specially formulated so that it does not react with ammonia. The technology used in this fluid is used by many OEM refrigeration system manufacturers as their factory & service fluids.

BVA 717P-68 specialized formulation, together with its two stage hydrocracked base stocks, gives it excellent oxidation resistance, high viscosity, film strength at operating temperatures, fast separation from ammonia and excellent demiscibility.

BVA 717P-68 ammonia refrigeration fluid is recommended for all compressor lubricants in ammonia refrigeration systems. Its non sludging and oxidation resistant properties make it the perfect choice for ammonia systems.

Ordering Information

717P-68P or 11393	5 gallon pail
717P-68D or 11394	55 gallon drum

BVA 4214 SERIES

BVA 4214 series was one of the first POE's developed for use in refrigeration applications. 4214-150 was developed in 1984 for use with R-22. It offers high miscibility and yet the viscosity is high enough that lubricity will not suffer. The 4214 series is available in ISO 150, 220 and 320 viscosities.

Ordering Information

4214-150G or 13991	1 gallon
4214-150P or 13992	5 gallon pail
4214-150D or 13993	55 gallon drum
4214-320G or 13997	1 gallon
4214-320P or 13998	5 gallon pail
4214-320D or 13999	55 gallon drum

BVA TR 300

BVA TR300 was developed to meet or exceed Trane code 1 oil 15 specs. Special care is taken to ensure that the aniline point exceeds 195° F. BVA TR2200 was developed to meet Trane 22 oil specs.

Ordering Information

TR300G or 52807	1 gallon
TR300P or 52808	5 gallon pail
TR300D or 52809	55 gallon drum

BVA TR 2200

Designed specifically for use in Trane centrifugal compressors. BVA TR 2200 meets or exceeds Trane 22 oils specs.

Ordering Information

TR2200G or 52810	1 gallon
TR2200P or 52811	5 gallon pail
TR2200D or 52812	55 gallon drum

BVA 717N-68

BVA 717N-68 is a specially formulated naphthenic lubricant designed for use in ammonia systems already using a naphthenic ISO 68 ammonia oil.

Ordering Information

717P-68P or 11893	5 gallon pail
717P-68D or 11894	55 gallon drum

BVA AUTO A/C LUBRICANTS

No matter what type of refrigerant you are using in your auto air conditioning system BVA has the right lubricant for you.

BVM 100N

has been the industry standard for auto a/c since it was first developed in 1983. It offers excellent high temperature stability and lubricity. BVM 100N is OEM approved and recommended for use with R-12. GM spec # 9985006.

BVA AUTO 100

Polyol ester developed for use when retrofitting an automotive compressor from R-12 to R-134a. Ease of use and compatibility with mineral oils makes the retrofit much easier.

BVA RPAG - 46 (Low Viscosity)

Polyalkylene glycol developed for use in automotive

systems using a low viscosity PAG in the presence of HFC 134a.

BVA RPAG 62

GM's new universal PAG. used in the new CVC compressor. Also ideal for Ford applications.

BVA RPAG - 100 (Medium Viscosity)

Polyalkylene glycol developed for use as a universal pag for auto systems using HFC 134a. This pag is compatible with most other pags available on the market.

BVA RPAG-125 GM APPROVED

Specially formulated Polyalkylene Glycol that is General Motors approved as an after market service lubricant for Harrison Thermal System Compressors.

AUTOMOTIVE A/C LUBRICANTS							
Property	BVM100	R46	R100	R125	R150	AUTO 100	
Type	MO	PAG	PAG	PAG	PAG	POE	
Viscosity cSt @ 40°C cSt @ 100° SUS @ 100°F SUS @ 210°F	102	46.52	101.68	134.6	150.75	97.11	
	11.12	9.47	9.6	25.1	17.5	10.95	
	524	234	538	678.1	783	507	
	64	57	59	121.9	89	63	
Viscosity Index	94	193	192	221	192	97	
Pour Point °C(°F)	-15(+5)	-44(-42)	-30(-22)	-42(-44)	-28(-7.6)	-36(-33)	
Flash Point °C(°F)	475(246)	157(315)	174(345)	485(251)	190(375)	271(520)	



Ordering Information					
	8 Ounce (CT)	1 Quart (Q)	1 Gallon (G)	Pail (P)	Drum (D)
525x	NA	52005	52006	52007	52008
100Nx	NA	52000	52002	52003	52004
RPAG 46x	13480	13482	13483	13484	13481
RPAG 100x	13485	13486	13487	13488	13489
RPAG 125x	13495	13496	13497	13498	13499
RPAG 150x	13490	13492	13493	13494	13595
AUTO 100x	13390	13392	13393	13394	13395

BVA ALKYL SERIES

At one time alkylbenzene lubricants were considered speciality lubricants. They were only used in low temperature applications where mineral oil did not have sufficient low temperature properties or it was used in systems where oil return was a problem.

BVA ALKYL Series is truly a wax-free lubricant. It is an alkylated benzene based lubricant and does not contain paraffin chains which cause floc problems.

BVA ALKYL Series has excellent miscibility with R-22. One of the components of interim refrigerants is R-22. This makes the BVA ALKYL Series miscible with some of the new interim refrigerants, such as, MP-39, MP-52, MP-66, HP-80 and HP-81. It also makes retrofitting easier and more cost effective.

ALKYL 100E - Developed and specially formulated for use in Bitzer screws using R-22.

ALKYL 200ca - Developed and formulated with a non intrusive additive package for retrofit applications using new interim refrigerants such as MP 39.



BVA ALKYL SERIES					
Property	ALKYL 150	ALKYL 200ca	ALKYL 300	ALKYL 500	ALKYL 100E
Viscosity					
@ 40°C cSt	28.2	46.0	53.0	90.0	98.0
@100°C cSt	4.1	4.92	5.6	7.35	8.15
@100°F SUS	150	210	280	480	500
Floc Point °C	< -73	<-73	<-73	<-73	<-73
Pour Point °C	-45	-42	-40	-30	-33
Color	1	1	<1	1	1
Flash Point °C	185	185	200	205	367
Di Electric Strength KV	40	40	40	40	40
Specific Gravity 60°F/60°F	0.87	0.87	0.87	0.87	0.87
Acid No.	0.01	0.01	0.01	0.01	0.01

BVA VAC 235

BVA VAC 235 is a very high quality vacuum pump oil with excellent thermal stability. The base oil is refined in such a way to remove the aromatic hydrocarbons which are the unstable components and the first to breakdown. It is then formulated to withstand the rigors of a long run.



Ordering Information

- 235PT or 11350
- 235Q or 11351
- 235G or 11352
- 235P or 11353
- 235D or 11354

- 1 pint
- 1 quart
- 1 gallon
- 5 gallon pail
- 55 gallon drum

BVA REFRIGERATION OILS

BVA REFRIGERATION OIL Series is made from naphthenic base crudes that are highly refined to provide proper lubrication in refrigeration and air conditioning systems.

BVA REFRIGERATION OILS are manufactured and refined by the Calumet Refining Company. Calumet's refrigeration oils are OEM approved and used by several major compressor manufacturers.

BVA REFRIGERATION OIL offers excellent chemical stability when in the presence of refrigerant and other compressor materials. BVA REFRIGERATION OILS have good thermal stability to ensure good performance at high temperatures as well as excellent low temperature properties to prevent congealing in the evaporator. The oils are also wax-free to prevent floc problems in the evaporator and expansion valve.

BVA REFRIGERATION OIL SERIES					
Property	BVA 3	BVA 4	BVA 5	BVA TR 300	BVA TR 2200
Viscosity					
@ 40°C cSt	29.55	64.94	96.8	60.0	60.0
@100°C cSt	4.43	6.76	9.0	6.3	6.3
@100°F sus	154	330	515	629	629
Floc Point °F	-60	-55	-35	-55	-35
Pour Point °F	-50	-35	-20	-35	-25
Color	<1	<1.5	<2.0	L1.5	L0.5
Flash Point °F	345	385	400	385	405
Di Electric Strength KV	25	25	25	25	25
Specific Gravity 60°F/60°F	0.911	0.911	0.916	0.911	0.888

BVA REFRIGERATION OIL SERIES				
	32 OZ. (Q)	1 GAL (G)	5 GAL (P)	55 GAL (D)
BVA 3 (3x)	✓	✓	✓	✓
BVA 4 (4x)		✓	✓	✓
BVA 5 (5x)	✓	✓	✓	✓
BVA TR300 (TR300x)		✓	✓	✓
BVA TR2200 (TR2200x)		✓	✓	✓

BVA ESTER TESTER

The BVA ESTER TESTER is a simple and safe way of determining the percentage of mineral oils in a compressor when changing over to a polyol ester. It is ideal for field testing when you are looking for immediate results.

The ESTER TESTER is accurate to within $\pm 1\%$. Chemical test kits are ester specific and do not work on all esters. The ESTER TESTER will work on all types of oils operating between a range of 1.355 to 1.520.

The only thing necessary to operate the ESTER TESTER is a good source of light and graph paper.



ESTER TESTER
ESTER TESTER Graph Paper
Pad of 100

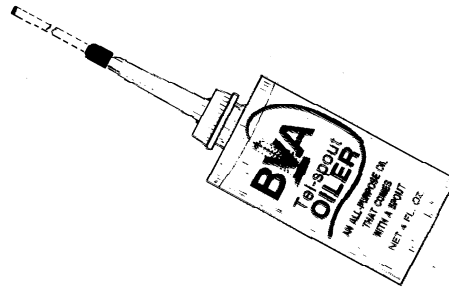
BVA ET
BVA ETGP

BVA TEL-SPOUT OILER

BVA TEL-SPOUT OILER is a new way to get at hard to reach locations not easily reached with conventional oiling devices.

BVA TEL-SPOUT OILER's spout extends to a total length of nine inches to deliver a premium quality non-detergent rust and oxidation inhibited oil where it is needed.

BVA TEL-SPOUT OILER can be used to lubricate electric motors, pumps, bicycle chains, oil lubricated bearing and a myriad of other machine devices.



BVA TEL-SPOUT OILER easily fits into a tool box. The specially patented spout prevents leaks when on its side.

BVA TSO

4 oz. bottle

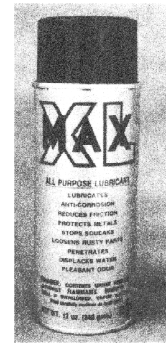
BVA MAX XL

BVA MAX XL is an excellent lubricant and corrosion preventative. It is superior to other water displacing fluids because it is developed from a lubricant base stock which enhances its lubricating qualities.

BVA MAX XL lubricant base has inherent low volatility relative to other fluids. This allows it to stay in place longer, as well as lubricate and give rust protection.

BVA MAX XL's low viscosity makes it an excellent solvent and will serve as a degreaser for cleaning parts, and then protecting them against rust and corrosion.

BVA MAX XL can be used in a variety of applications. One unique application, it is an excellent gun cleaning lubricant. Its pleasant citrus odor enables you to use it indoors.



BVA MAX XL	
	MAX XL (MAXx)
12 OZ aerosol (C)	✓
32 OZ. (Q)	✓
1 GALLON (G)	✓
5 GALLON (P)	✓
55 GALLON (D)	✓

BVA RUST BUSTER

BVA RUST BUSTER is a chemical designed to penetrate and break-free the bond to enable you to loosen a nut that was once rusted tight.

BVA RUST BUSTER also comes with a telescoping spout. The spout extends to a total length of

nine inches enabling you to reach an area that might not have been readily accessible. This is a product that sells itself where rust is a problem.

BVA BUSTER

4 oz. bottle