

Refrigerant Cross-Reference Guide

ASHRAE No.	Tradename	Manufacturer	Type	Lubricant	Evaporator Temperature			Applications
					High	Med	Low	
R-12 Replacements								
R-134a	Suva® 134a Genetron® 134a Forane® 134a Klea® 134a	Dupont Honeywell Atofina ICI	HFC	POE	X	X		Commercial refrigeration, appliances, chillers, automotive A/C (new & retrofit)
R-401A	Suva® MP39 Genetron® MP39	Honeywell	HCFC	MO or AB	X	X		Positive displacement refrigeration equipment, supermarket systems (medium temp), walk-in coolers
R-409A	Suva® 409A	Dupont	HCFC	MO or AB	X	X		Positive displacement refrigeration equipment, supermarket systems (medium temp), walk-in coolers
R-500 Replacements								
R-401B	Suva® MP66 Genetron® MP66	Dupont Honeywell	HCFC	MO or AB		X	X	Closest performance match to R-500. Best retrofit choice for R-12 freezers R-12 transport refrigeration equipment
R-502 Replacements								
R-404A	Suva® HP62 Genetron® 404A Forane® 404A	Dupont Honeywell Atofina	HFC	POE	X	X	X	New equipment & retrofit for commercial refrigeration R-502 transport refrigeration
R-507	Suva® 507 Genetron® AZ50 Forane® 507	Dupont Honeywell Atofina	HFC	POE	X	X	X	New equipment & retrofit for commercial refrigeration R-502 transport refrigeration
R-408A	Suva® 408A Genetron® 408A Forane® 408A	Dupont Honeywell Atofina	HCFC	MO or AB	X	X	X	Existing commercial refrigeration equipment
R-402A	Suva® HP80	Dupont	HCFC	MO or AB	X	X	X	Existing commercial refrigeration equipment
R-402B	Suva® HP81	Dupont	HCFC	MO or AB		X	X	Ice machines and other selected applications
R-22 Replacements								
R-407C	Suva® 407C Genetron® 407C Forane® 407C Klea® 407C	Dupont Honeywell Atofina ICI	HFC	POE	X			Positive displacement A/C equipment, new commercial & light industrial commercial A/C, existing residential & commercial/light commercial A/C Always consult the OEM for guidance
R-410A	Suva® 410A Puron® Genetron® 410A Forane® 410A	Dupont Carrier Honeywell Atofina	HFC	POE	X			Positive displacement A/C equipment, new residential & commercial A/C & heat pumps designed for R-410A. May be used in some existing R-22 A/C systems, but extensive changes requires. Always consult the OEM.
R-13, R-23 & R-503 Replacements								
R-508B	Suva® 95 Genetron® 508B	Dupont Honeywell	PFC	POE			Below -40°F	New & existing VLT (below -40°F) applications, Cascade refrigeration systems
R-11 Replacements								
R-123	Suva® 123 Genetron® 123 Forane® 123	Dupont Honeywell Atofina	HCFC	MO	X	X		New & existing centrifugal chillers (consult OEM)
R-114 Replacements								
R-124	Suva® 124 Genetron® 124 Forane® 124	Dupont Honeywell Atofina	HCFC	AB	X	X		Industrial refrigeration & A/C High ambient A/C

Notes:
 Suva® HFC refrigerants: (1) long-term replacements, (2) zero ozone depletion, (3) no phase-out date. All Suva® refrigerants are UL classified and have A1 ASHRAE safety classification, except Suva® 123 which has a B1 ASHRAE safety classification.
 AB = Alkybenzene
 MO = Mineral Oil
 POE = Polyol Ester

APPLICATION NOTE:

This information is provided for reference only. No guarantees are expressed or implied as to suitability or fitness for use, as all projects are subject to variations. Not for construction. Seek professional advice prior to application or use.

Refrigeration Oils

With the changes that have taken place in our industry due to the CFC issue, we have reevaluated our lubricants to ensure compatibility with the new HFC refrigerants and HCFC interim blends offered by several chemical producers. As a secondary criteria, it is also desirable that any new lubricant be compatible with the traditional refrigerants such as CFC-12, HCFC-22 or R502. This "backward compatibility" has been achieved with the introduction of the Polyol ester lubricants.

The table below summarizes which oils/lubricants are approved for use in Copeland compressors:

Refrigeration Oils	Traditional Refrigerants HCFC-22	Interims R401A, R401B, R402A	HFC's HFC-134a, R404A, R507
POE's Mobil EAL ARCTIC 22 CC	A	A	P
ICI (Virginia KMP) EMKARATE RL 32CF	A	A	P
Mineral Oils Suniso 3GS	P	PM	
Texaco WF32	P	PM	
Calumet R015 (Witco)	P	PM	NOT ACCEPTABLE
Sontex 200-LT (White Oil)	(BR & Scroll Only)		
Witco LP-200	P		
A/B Zerol 200TD	AM	PM	NOT ACCEPTABLE
Soltex Type AB-200		PM	

Note: P = Preferred lubricant choice. A = Acceptable alternative M = Mixture of mineral oil and alkyl benzene (AB) with minimum 50% AB.

Polyol Ester Lubricants

Ester lubricants (POE) have the characteristics of quickly absorbing moisture from the ambient surroundings. This is shown graphically in the Hygroscopicity chart below where it can be seen that such lubricants absorb moisture faster and in greater quantity than conventional mineral oils. Since moisture levels greater than 100 PPM will result in system corrosion and ultimate failure, it is imperative that compressors, components, containers and the entire system be kept sealed as much as possible. Lubricants will be packaged in specially designed, sealed containers. After opening, all the lubricant in a container should be used at once since it will readily absorb moisture if left exposed to the ambient. Any unused lubricant should be properly disposed of. Similarly, work on systems and compressors must be carried out with the open time as short as possible. Leaving the system or compressor open during breaks or overnight **MUST BE AVOIDED!**

Oil Level

During Copeland's testing of Polyol ester oil, it was found that this lubricant exhibits a greater tendency to introduce oil into the cylinder during flooded start conditions. If allowed to continue, this condition will cause mechanical failure of the compressor.

A crankcase heater is required with condensing units and it must be turned on several hours before start-up.

Oil level must not exceed 1/4 sight glass.

Mineral Oils

The BR and Scroll compressors use Sontex 200, a "white oil". This oil is not suitable for low temperature applications nor is it available through the normal refrigeration wholesalers. For field "top-off" the use of 3GS or equivalent, or Zerol 200TD is permissible, as long as at least 50% of the total oil charge remains Sontex 200.

Suniso 3GS, Texaco WF32 and Calumet R015 (yellow oils) are available through normal refrigeration wholesalers. These oils are compatible if mixed and can be used on both high and low temperature systems.

Polyol Ester Lubricants

The Mobil EAL Arctic 22 CC is the preferred Polyol ester due to unique additives included in this lubricant. ICI Emkarate RL 32S is an acceptable Polyol ester lubricant approved for use when Mobil is not available. These POE's must be used if HFC refrigerants are used in the system. They are also acceptable for use with any of the traditional refrigerants or interim blends and are compatible with mineral oils. They can therefore be mixed with mineral oils when used in systems with CFC or HCFC refrigerants. These lubricants are compatible with one another and can be mixed.

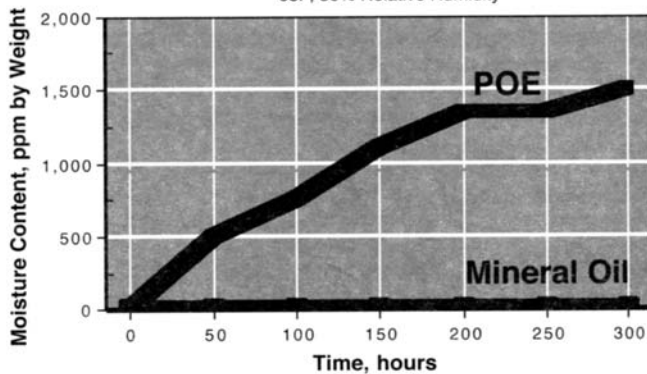
Alkyl Benzenes

Zerol 200 TS is an alkyl benzene (AB) lubricant. Copeland recommends this lubricants for use as a mixture with mineral oil (MO) when using the interim blends such as R-401A, R-401B and R-402A (MP39, MP66 and HP80). A minimum of 50% AB is required in these mixtures to assure proper oil return.

Shell MS 2212 is a 70/30 mixture of AB/MO. If this lubricant is used in a retrofit situation virtually all of the existing MO must be drained prior to refilling with the MS2212 to assure a minimum 50% AB content.

Hygroscopicity

68F, 50% Relative Humidity



Color

As received, the POE lubricant will be clear or straw colored. After use, it may acquire a darker color. This does not indicate a problem as the darker color merely reflects the activity of the lubricant's protective additive.

**We are continually adding new products.
Call us with your inquiries.**