

Refrigerants and lubricants approved for use in Copeland™ compressors

	Refrigerants	Class *	GWP* **	Similar to	Application		Lubricant choices			Comments	
					Retrofit	New	Preferred	Alternate #1	Alternate #2		
Ozone depleting	CFC R-12		10900		L,M		MIN	AB & MIN		Phased out in 1996	
	CFC R-502		4657		L,M		MIN	AB & MIN	POE-32	Phased out in 1996	
	HCFC R-22		1810		L,M,H		MIN	AB & MIN	POE-32	No new equipment 2010* *	
	HCFC R-401A		1182	R-12	M,H		AB & MIN	POE-32 & MIN	POE-32	For service applications only, trade name: Freon™ MP39	
	HCFC R-401B		1288	R-12	L,M		AB & MIN	POE-32 & MIN	POE-32	For service applications only, trade name: Freon MP66	
	HCFC R-402A		2788	R-502	L,M		AB & MIN	POE-32 & MIN	POE-32	For service applications only, trade name: Freon HP80	
	HCFC R-402B		2416	R-502	L,M		AB & MIN	POE-32 & MIN	POE-32	For service applications only, trade name: Freon HP81	
	HCFC R-408A		3152	R-502	L,M		AB & MIN	POE-32 & MIN	POE-32	For service applications only, trade name: FX10	
	HCFC R-409A		1909	R-12	L,M		AB & MIN	POE-32 & MIN	POE-32	For service applications only, trade name: FX56	
Non-ozone depleting	HFC R-134a	A1	1430	R-12	M,H	M,H	POE-32				
				R-12	L,M	L,M	POE-22B			Hatcol 4408/Savsyn 200KC for use with specific Copeland compressors designed for R-134a manufactured in India	
				R12	L,M	L,M	POE-22D			Compressors produced in Brazil	
				R12	L,M		POE-22A	POE-22D		Compressors produced in Slovakia	
	HFC R-404A		3922	R-502	L,M	L,M	POE-32			Freon HP62, Forane™ FX70	
				R-502	L,M	L,M	POE-22C			For use with compressors manufactured in India	
				R-502	L,M	L,M	POE-22A	POE-22D		Compressors produced in Slovakia	
	HFC R-507		3985	R-502	L,M	L,M	POE-32			Genetron™ AZ50	
	HFC R-407A		2107	R-22	L,M	L,M	POE-32				
	HFC R-407C		1774	R-22	L,M,H	L,M,H	POE-32			Freon 9000/KLEA 66	
	HFC R-407F		1825	R-22	L,M	L,M	POE-32			Discus™ and select refrigeration scroll models (ZF/ZB)	
	R-407H		1495	R-22/R-404A	L,M		POE-32			Discus models and Copeland ZB and ZF scrolls for refrigerated rack retrofit	
	R-448A		1387	R-22/R-404A	L,M	L,M	POE-32			Solstice™ N40	
				R-22/R-404A	L,M	L,M	POE-22A	POE-22D		Compressors produced in Slovakia	
				R-22/R-404A	L,M	L,M	POE-32			Opteon™ XP40	
	R-449A		1396	R-22/R-404A	L,M	L,M	POE-22A	POE-22D		Compressors produced in Slovakia	
				R-12/R-134a	M,H	M,H	POE-32			Solstice N13 for refrigeration applications only	
				R12	L,M	L,M	POE-22D			Compressors produced in Brazil	
	R-450A		601	R-12/R-134a	M,H	M,H	POE-22A	POE-22D		Compressors produced in Slovakia	
				R-12/R-134a	M,H	M,H	POE-32			Opteon XP10 for refrigeration applications only	
				R12	L,M	L,M	POE-22D			Compressors produced in Brazil	
	R-513A		630	R-12/R-134a	M,H	M,H	POE-22A	POE-22D		Compressors produced in Slovakia	
				R12	L,M	L,M	POE-22D			Compressors produced in Brazil	
				R-12/R-134a	M,H	M,H	POE-22A	POE-22D		Compressors produced in Slovakia	
	R-452A		2140	R-22/R-404A	L,M	L,M	POE-32			OPTEON™ XP44 for U.S. and European pre-approved applications only	
	HFC R-410A		2688				Discus = L,M Scroll = M,H	POE-32			Copeland ZP & ZB KCP scroll models and certain Discus models only
							M,H	PVE-68			For use with specific highside variable speed compressors manufactured in Suzhou.
	HFC R-422A		3143	R-22	L,M			POE-32	MIN	AB	Discus supermarket racks only
	HFC R-422D		2729	R-22	L,M			POE-32	MIN	AB	Discus supermarket racks only
	HFC R-427A		2138	R-22	L,M			POE-32			Discus supermarket racks only
	HFC R-438A		2265	R-22	L,M			POE-32	MIN	AB	Discus supermarket racks only; Freon MO99
	R-704 helium		1					Cryogenic	PAG		Copeland ZC scroll models only
	R-744 CO ₂		1					Sub-critical	POE-68	PAG-68	
						Sub-critical	PAG-68	POE-68		RFL68EP for CO ₂ compressor manufactured in Europe	
						Trans-critical	POE-68	PAG-68		4MTLS semi-hermetic compressors for medium temp trans-critical applications	

Continued on reverse ➡

	Refrigerants	Class *	GWP ***	Similar to	Application		Lubricant choices			Comments
					Retrofit	New	Preferred	Alternate #1	Alternate #2	
Non-ozone depleting	R-32	A2L	675	R410A	M,H	M,H	POE-46	SP32		SP32 covers VE/ZE compressors manufactured in Asia only
				R410A	M,H	M,H	POE-32B	POE-46		For use with specific compressors designed for R-32 manufactured in Suzhou
	R-454A		239	R22/R404A	–	L,M	POE-32			Not for retrofit into A1 systems
	R-454B		466	R410A	–	M,H				
	R-454C		148	R22/R404A	–	L,M				
	R-455A		145	R410A	–	M,H				
	R-290 propane	A3	3			L,M,H	POE-68B			For use with specific Copeland scroll compressors manufactured in North Ireland for R-290
						L,M	POE-22A			For use with specific Copeland compressors designed for R-290, excluding models manufactured in India
							POE-32			For use with specific Copeland compressors manufactured in India for R-290
							PAG-68			
							AB/POE-32			CPI 4708-32, ALP 360A-22 used in compressors produced in Brazil
							POE-10			Compressors produced in Mexico

Legend:

MIN:	Mineral Oil (Copeland 46BWMO, Calumet RO15, Chevron/Texaco Capella WF32, Sonneborn Suniso 3GS, 3GS-P, Savsol 3000, Sonneborn LP200 and Savsol LP200, Sonneborn LP201, Sontex 200LT, KRP-32, KRW-35) Mineral oils are interchangeable for 'top off' purposes
AB:	Alkyl Benzene Oil (AB46 Copeland Ultra 200, National NL AKB200R, Shrieve Zerol 200 TD, Sonneborn Suniso AKB200A, Shell 2212, CPI-4708-32)
POE-32:	Polyolester Oil (Copeland Ultra 32-3MAF, Lubrizol Emkarate RL32-3MAF, Everest 32-3MAF, National NL PE32-3MAF, Parker EMKARATE RL32-3MAF/ (Virginia) LE323MAF, Nu Calgon 4314-66/EMKARATE RL32-3MAF, Cryolant RL-32EA, Patech 3MAP, Shrieve 3MAF (Everest 22 CC, Copeland Ultra 22 CC, Mobil Arctic 22 CC) Last three are approved for 'top off' only, 32-3MAF preferred
POE-32B:	Everest SP 32 POE
POE-46:	NXG5020 POE
POE-22A:	Emkarate RL22H, RL22HB
POE-22B:	Hatcol 4408, Savsyn 200KC
POE-22C:	HXL-8828, Hatcol 4440
POE-22D:	CP2922E, CPI RL 22DQ, RL 22LSHF
POE-10:	CP 2910E
PAG:	Polyalkylene Glycol Oil (Lubrizol RPAG 62, UCON LB300X, UCON LB-170-X)

PAG-68:	Zerol RFL 68-EP
PVE-68:	FVC 68D for high-side variable speed
POE-32 & MIN:	Minimum 50% POE
AB & MIN:	Minimum 50% Alkyl Benzene
POE-68:	Emkarate RL68HB oil for use with R-744 CO ₂ applications
POE-68B:	Hatcol 4467 POE 68 (ISO 68 viscosity grade), Chemtura
L:	Low Temperature Application (Refrigeration) for R-407A, R-407C, R-407F, R-422A/D, R-427A, R-438A, R-448A, R-449A Demand Cooling™ or auxiliary cooling may be required for low temperature application - See AE guidelines for details
M:	Medium Temperature Application (Refrigeration)
H:	High Temperature Application (Air-Conditioning, Heat Pump, Refrigeration)
*	ASHRAE Std. 34 Refrigerant Classification: A1=Non-Flammable/Non-Toxic; A2, A2L=Mildly Flammable/Non-Toxic; A3 = Flammable/Non-Toxic; B2, B2L = Mildly Flammable/Toxic. A2L and B2L are lower flammability refrigerants with a maximum burning velocity of ≤ 3.9 in/sec (10cm/s)
**	A & R product lines with R-22 are only approved for use with AB oil.
***	GWP# subject to change – Data from refrigerant manufacturer and EPA documents.
NOTE:	A2L refrigerants are only for use in compressors they have been approved for and should not be retrofitted into non-A2L compressors or products.
	Spectronics AR-GLO 4/E Fluorescent Leak Detection Dye is approved for HFC/POE and HCFC/Mineral Oil usage at the manufacturer's recommended concentrations.

CAUTION: POE must be handled carefully and the proper protective equipment (gloves, eye protection, etc.) must be used when handling POE lubricant. POE must not come into contact with any surface or material that might be harmed by POE, including without limitation, certain polymers (e.g. PVC/CPVC and polycarbonate). Do not take internally. Avoid eye contact and prolonged or repeated skin contact. Safety Data Sheets are available at your supplier.

For specific product availability and performance data refer to Emerson sales literature.

Refer to Application Engineering bulletins, change-over guidelines and MSDS sheets for additional information at [Emerson.com/OPI](https://www.emerson.com/OPI)

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