

RS-44



New Zero ODP Drop-in
Replacement for R22

No oil change required
Compatible with all lubricants

ASHRAE DESIGNATION

R-424A

SAFETY CLASSIFICATION: A1



from

REFRIGERANT SERVICES INC.



RS-44



The new Zero ODP Drop-in Replacement compatible with all lubricants

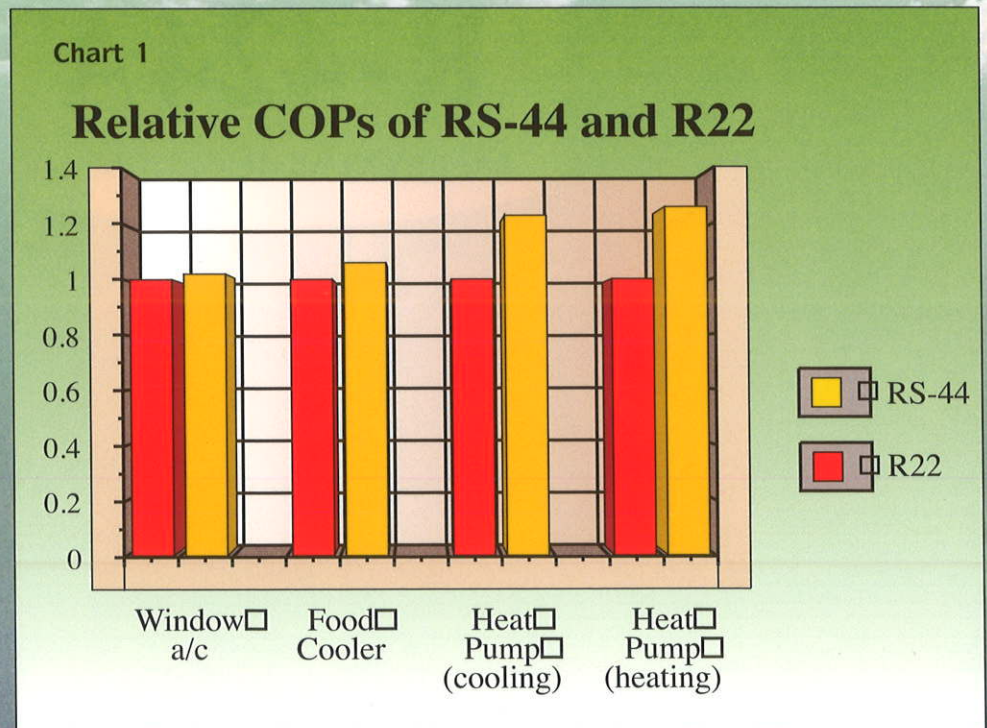
HCFC 22 is a controlled substance under the Montreal Protocol and European Regulation and will be phased out on a global basis with all other HCFCs. HCFC 22 is already banned in Europe in most new equipment and is subject to a rapidly tightening cutback schedule. It is, therefore, now time to consider the options for replacing HCFC 22 which will become restricted in availability as these cutbacks come into effect.

RS-44 provides a low cost and easy solution to replacing HCFC 22 by avoiding a costly and technically unsatisfactory retrofit situation. By definition, any replacement for HCFC 22 must have no ozone depleting ability so that, in contrast to replacing CFCs (e.g. R12, R502) where there were 'interim' blends available (largely containing HCFC 22) enabling the existing lubricant in the system to be used, this is not an option when seeking to replace HCFC 22. RS-44 has a zero Ozone Depletion Potential, a similar performance to HCFC 22 and can be used with all types of lubricants.

Comparison with HCFC 22

- Higher Coefficient of Performance
- Lower discharge temperature
- Zero Ozone Depletion Potential
- Non-flammable
- Lower discharge pressure
- Similar capacity
- Compatible with existing oils
- No hardware changes needed

The lower head pressure obtained when using RS-44 provides significant operational benefits, while the higher Coefficient of Performance reduces energy costs and has a beneficial effect on the Total Equivalent Warming Impact (TEWI) of the whole system. The significantly lower discharge temperatures and pressures of RS-44 improve the reliability and extend the life of the compressor, and reduce the problem of oil decomposition.

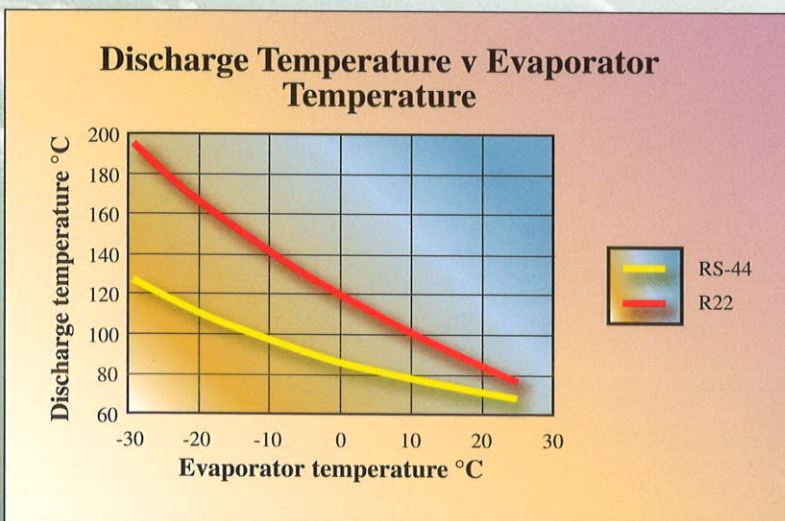
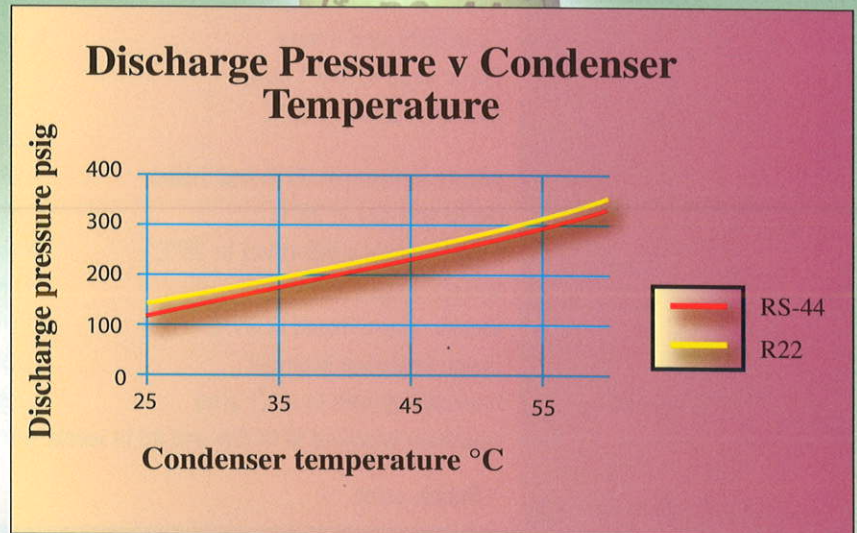


Lubricants

RS-44 is compatible with both the traditional and new synthetic lubricants so that there is no need to change the oil when converting from HCFC 22 to RS-44. RS-44 is suitable for use with mineral, alkylbenzene and polyol ester lubricants.

Applications

RS-44 has been developed for use in all applications where HCFC 22 has traditionally been used including commercial air conditioning, cold stores, supermarkets, dairy chillers, refrigerated transport, cellar cooling and others.



Safety

The components of RS-44 have been subjected to toxicity tests carried out by Alternative Fluorocarbons Environmental Acceptability Study (AFEAS), and have been declared to be of low toxicity. Health and safety data is available on request. RS-44 is non-flammable as formulated.

Servicing

Because RS-44 is a blend, it should be charged into the system in the liquid as opposed to vapour form. There is no need to make any hardware changes when converting from R22 to RS-44.

RS-44 Physical Properties

		RS-44	R22
Molecular weight		108.1	86.5
Boiling point at 1 atm	°C	-38.7 ⁽¹⁾	-40.8
	°F	-37.6 ⁽¹⁾	-41.4
Critical temperature	°C	88.8	96.1
	°F	191.8	204.8
Critical pressure	bara	40.4	49.9
	psia	586	724
Liquid density at 25°C	kg/m ³	1169	1191
Density of saturated vapour at 25°C	kg/m ³	43.6	44.2
Latent heat of vaporisation at boiling point	kJ/kg	196 ⁽¹⁾	234
Cv at 25°C and 1 bara	kJ/kg.K	0.765	0.559
Cp at 25°C and 1 bara	kJ/kg.K	0.85	0.662
Cp/Cv at 25°C and 1 bara		1.111	1.185
Vapour pressure at 25°C	bara	9.67 ⁽¹⁾	10.4
	psia	140.2 ⁽¹⁾	151
Vapour viscosity at 25°C and 1 bara	cP	0.0122	0.0126
Liquid viscosity at 25°C	cP	0.167	0.166
Liquid thermal conductivity at 25°C	W/m.K	0.072	0.0837
Surface tension at 25°C	N/m	0.00656	0.00808
Specific heat of liquid at 25°C	kJ/kg.K	1.423	1.26
Ozone Depletion Potential	ODP	0	0.055
Flammability limit in air (1 atm)	vol%	None	None
Inhalation exposure (8 hr day and 40 hr week)	ppm	1000	1000

⁽¹⁾ Bubble point



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