

# RS-50 (R442A)

Low global warming replacement for  
R404A, R507 and R22 in refrigeration



*from*

***REFRIGERANT SOLUTIONS LIMITED***

**The Refrigerant Specialists**



# RS-50 (R442A)

## *Low global warming & higher efficiency replacement for R404A & R507*

RS-50 has a Global Warming Potential (GWP) of less than one half of R404A together with a higher efficiency which delivers energy savings & a lower contribution to global warming.

RS-50 can be used to replace R404A in both new & existing equipment. Mass flow of RS-50 is lower than R404A and R507 so that reducing the opening of the expansion device may be required. No changes to other hardware are necessary. A significant increase in energy efficiency compared to R404A and R507 can be expected. Users will achieve a lower carbon footprint due to the lower direct GWP of the refrigerant & its inherent higher efficiency.

## *Replacement for R22 in refrigeration applications*

RS-50 is a non ozone depleting and non flammable replacement for R22 in medium and low temperature refrigeration applications. The efficiency and cooling capacity of RS-50 provides a close match for R22 in overall system performance. Flow rate is identical to R22 which avoids the need to change or alter existing pipework.

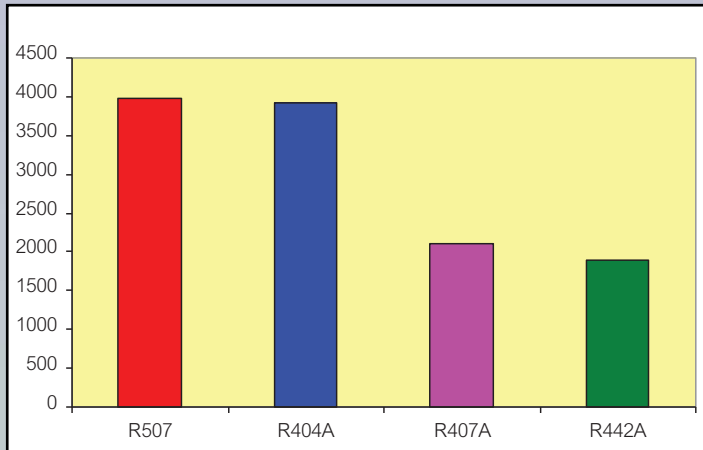
## *Performance Characteristics*

- **Global Warming Potential less than half of R404A & R507**
- **Suitable in OEM & retrofit applications**
- **ASHRAE safety classification of A1**
- **Higher Coefficient of Performance than R404A & R507**
- **Higher capacity than R404A, R507 & R22**
- **Effective at medium and low temperatures**
- **Good match for R22 in refrigeration applications**
- **Mass flow equivalent to R22 and considerably lower than R404A & R507**
- **Zero Ozone Depletion Potential**
- **Non flammable & low toxicity**

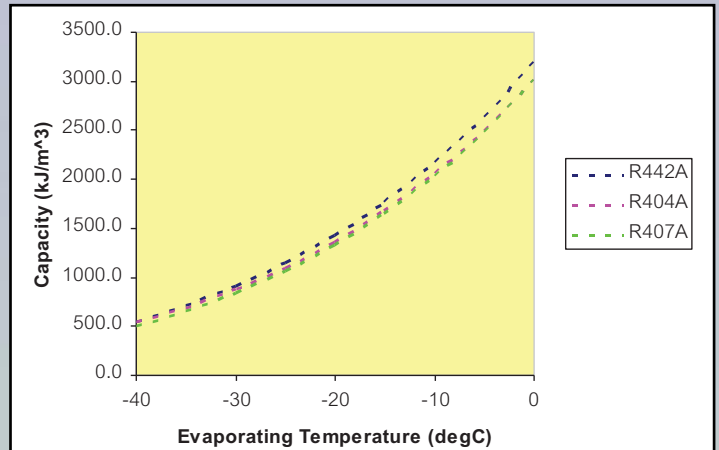
# RS-50 (R442A)



### Global Warming Potentials



### Refrigerant Capacities



## Applications

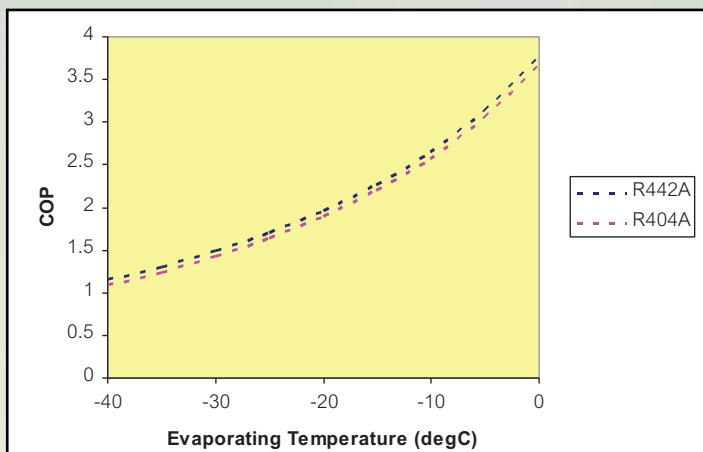
Because the properties of RS-50 are similar to R404A, it is suitable for use in many of the applications where R404A is commonly found including supermarket display cases, cold stores, freezers, refrigerated transport, ice machines, cold storage, transportation of foodstuffs, freezer cabinets, beer cellars, freeze dryers & environmental test chambers.

R22 is also used in many of these refrigeration applications where RS-50 can be a suitable replacement.

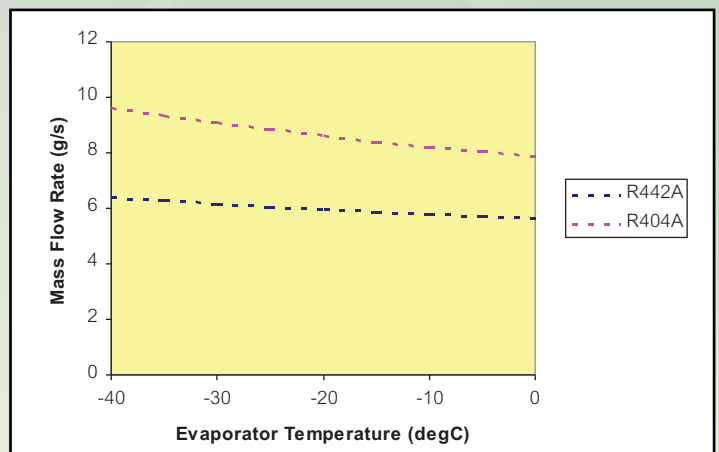
## Lubricants

RS-50 is compatible with the same (POE) lubricants which are commonly used with R404A so that there is no need to change the oil when converting from R404A to RS-50. When replacing R22 with RS-50, the lubricant should be changed to a polyol ester oil.

### COP



### Mass Flow Rates



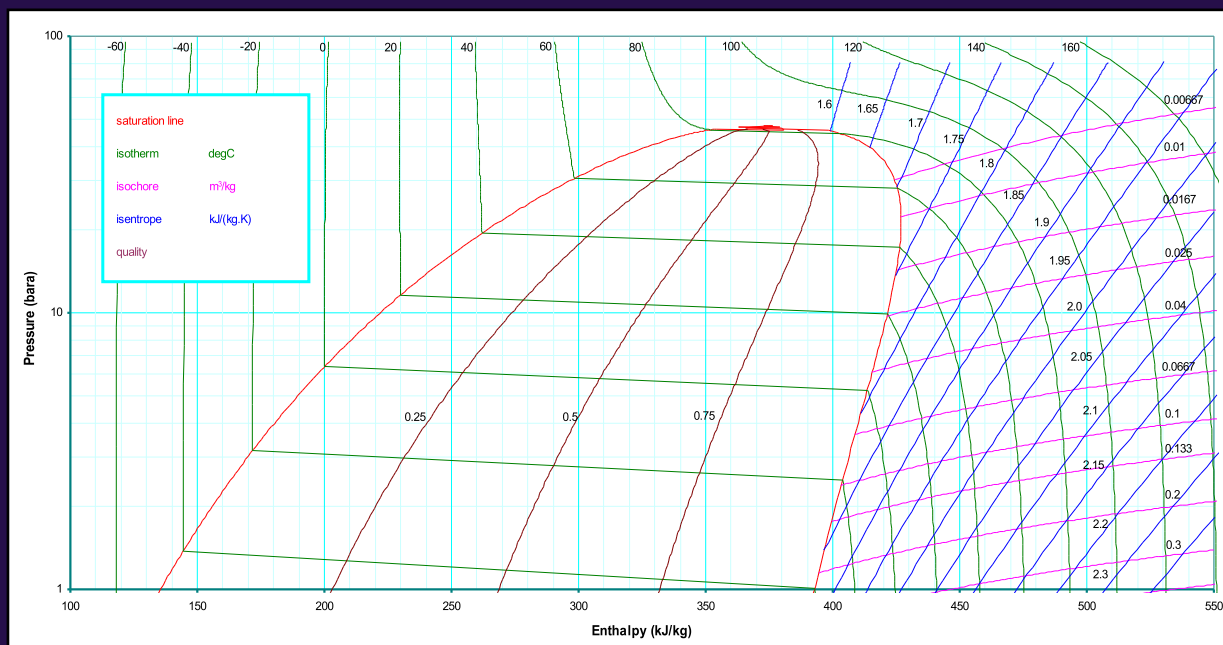
## Safety

RS-50 is non flammable under all conditions of fractionation as per ASHRAE Standard 34. The components of RS-50 have been subjected to toxicity tests carried out by Alternative Fluorocarbons Environmental Acceptability Study (AFEAS), and have been declared to be of low toxicity. RS-50 has been designated a refrigerant number of R442A by the ASHRAE with a safety classification of A1.

## Servicing

Because RS-50 is a blend, it should be charged into the system in the liquid as opposed to vapour form. There is no need to make hardware changes when converting from R404A to RS-50 other than reducing the opening of the expansion device. Because RS-50 has a similar flow rate to R22, there is no need to adjust or change the expansion device during a retrofit.

# RS-50 (R442A) Pressure-enthalpy chart



## RS-50 (R442A) Physical Properties

PROPERTY		RS-50	R404A	R22
Molecular Weight		81.8	97.6	86.5
Boiling point (1 atm)	°C	-46.5 <sup>(1)</sup>	-46.2 <sup>(1)</sup>	-40.8 <sup>(1)</sup>
	°F	-51.6 <sup>(1)</sup>	-51.2 <sup>(1)</sup>	-41.5 <sup>(1)</sup>
Temperature Glide	K	4.6	0.5	0
Critical Temperature	°C	82.4	72.1	96.1
	°F	180.3	161.7	205.1
Critical Pressure	bara	47.6	37.3	49.9
	psia	690	541	724
Liquid Density (25°C)	kg/m <sup>3</sup>	1108	1044	1191
Density of saturated vapour (25°C)	kg/m <sup>3</sup>	47.7	65.3	44.2
Latent Heat of Vaporisation at boiling point	kJ/kg	266 <sup>(1)</sup>	200 <sup>(1)</sup>	234
Cv (25°C & 1bara)	kJ/kg.k	0.727	0.784	0.559
Cp (25°C & 1bara)	kJ/kg.k	0.838	0.877	0.662
Cp/Cv (25°C & 1 bara)		1.152	1.118	1.185
Vapour Pressure (25°C)	bara	13.3 <sup>(1)</sup>	12.6 <sup>(1)</sup>	10.4
	psia	192 <sup>(1)</sup>	182 <sup>(1)</sup>	151
Vapour Viscosity (25°C & 1 bara)	cP	0.0126	0.0120	0.0126
Liquid Viscosity (25°C)	cP	0.141	0.128	0.164
Liquid Thermal Conductivity (25°C)	W/m.K	0.0857	0.0636	0.0835
Surface Tension (25°C)	N/m	0.00661	0.00455	0.00808
Specific heat of liquid (25°C)	kJ/kg.K	1.58	1.54	1.26
Ozone Depletion Potential	ODP	0	0	0.055
Flammability limit in air (1 atm)	vol%	none	none	none
Inhalation exposure (8 hour day & 40 hour week)	ppm	1000	1000	1000

<sup>(1)</sup> Bubble Point



**REFRIGERANT SOLUTIONS LIMITED**

8 MURIESTON ROAD, HALE, ALTRINCHAM, CHESHIRE WA15 9ST  
Tel: (+44) (0)161 926 9876 Fax: (+44) (0)161 926 9875 Email: rs@refsols.com Web: www.refsols.com