

# RS-52 (R428A)

Zero ODP Drop-in replacement for R22  
at low temperatures, R502 &  
interim ozone depleting blends

No oil change  
Compatible with all lubricants

No change of hardware



*from*

***REFRIGERANT SOLUTIONS LIMITED***

**The Refrigerant Specialists**



# RS-52 (R428A)

## *Zero ODP replacement for R22 & R502 ozone depleting blends & compatible with all lubricants*

RS-52 is a non ozone depleting near azeotropic refrigerant blend which can replace R22, R502 and the interim ozone depleting blends including R402A, R403B, R408A & R411B without the need to change the existing lubricant or make any changes to the system other than adjustment to the expansion device in some cases. RS-52 is targeted towards lower temperature applications.

RS-52 is compatible with all lubricants including both the traditional oils such as mineral and alkylbenzene oils and

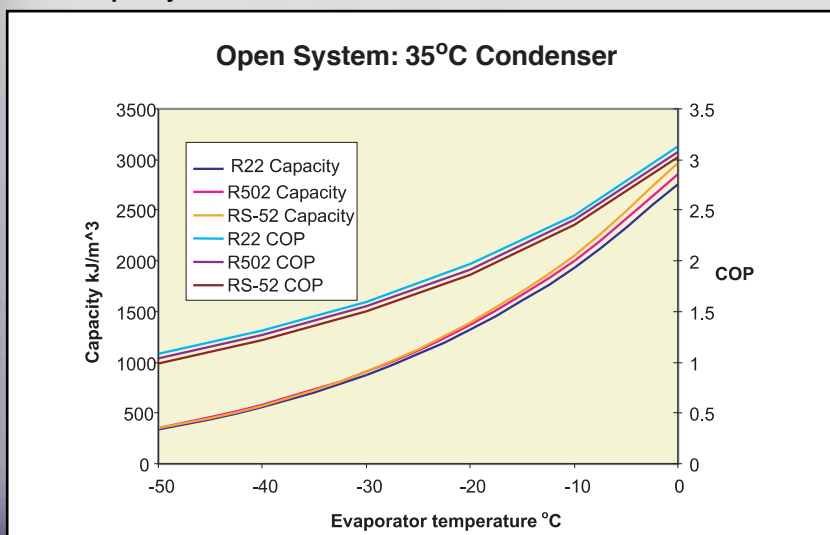
also the new synthetic polyol ester lubricants. Converting to RS-52 is a straightforward process which avoids a costly and often technically unsatisfactory retrofit (eg draining the oil from the system, replacing the seals etc).

RS-52 is a capacity match for R502 and has a temperature glide of less than 1°C. RS-52 can also replace R22 in systems which are rated for R502. RS-52 is suitable for use in flooded systems.

## *Performance Characteristics*

- **Close performance match for R502**
- **Can replace R22 in low temperature applications**
- **Compatible with MO, AB & POE lubricants**
- **Lower discharge temperatures**
- **Near azeotropic blend**
- **Suitable for new & existing equipment**
- **Capacity match for R502**
- **Low temperature glide <1°C**
- **Zero Ozone Depletion Potential**
- **Non flammable**
- **Low toxicity**
- **No changes to hardware needed**

RS-52 Capacity & Coefficient of Performance



## **High Capacity**

The high capacity of RS-52 qualifies its use as a direct replacement for R502, R403B (69L), R402A (HP80), R408A (FX10) & R411B without any loss of performance. Discharge pressures are similar to R507 and R404A.

The high capacity of RS-52 at low temperatures is a prominent feature of this new refrigerant.

# RS-52 (R428A)



## Lubricants

RS-52 is compatible with both the traditional and new synthetic lubricants so that there is no need to change the oil when converting to RS-52. RS-52 is suitable for use with mineral, alkylbenzene and polyol ester oils.

RS-52 avoids the costly and often technically unsatisfactory changeover to the new synthetic lubricants required of a full retrofit to R404A.

## No changes to hardware

RS-52 can replace R22 & other Ozone Depleting Substances at low temperatures without changes to the existing hardware. Approximately 10% less RS-52 is required to replace R22, & possibly a slight adjustment to the expansion device may be required. The changeover process is simple, straightforward & can be very cost effective in comparison to a full retrofit to R404A.

## Discharge Temperature

RS-52 has lower discharge temperatures, particularly compared to R22, which provides considerable operating benefits including an improvement in the reliability of the system and avoidance of lubricant breakdown.

## Applications

RS-52 is suitable for use in applications where R22, R502, R403B (69L), R402A (HP80), R408A (FX10) & R411B are commonly found including, but not restricted to, supermarket display cases,

ice machines, cold storage, transportation of foodstuffs, freezer cabinets, freeze dryers & environmental test chambers.

## Safety

RS-52 (R428A) has been awarded a safety classification of A1, namely of low toxicity and non flammable, by the American Society of Heating, Refrigerating and Air Conditioning-Engineers (ASHRAE).

## New Equipment

RS-52 with its rapid pull-down feature is suitable for use in new equipment with the added benefit of being able to be used with both the traditional & new synthetic lubricants.

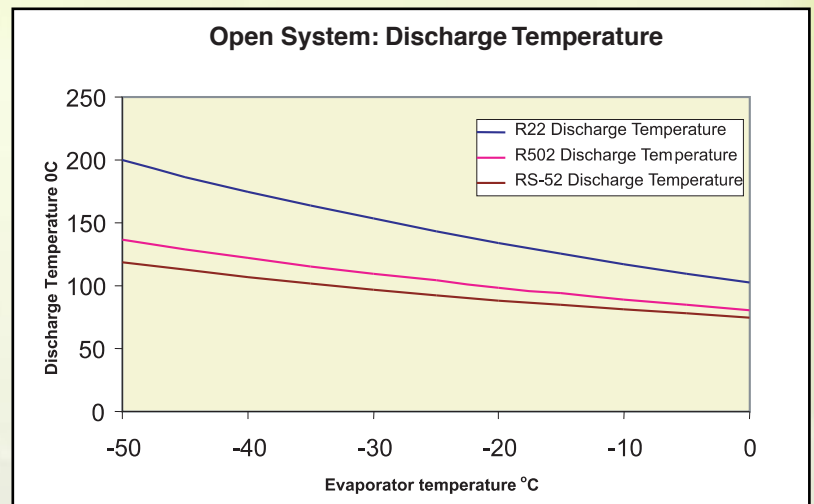
## Servicing

Because RS-52 is a blend, it should be charged into the system in the liquid as opposed to vapour form. Vapour filling is possible when the total cylinder contents are charged into the system. Because RS-52 is a near azeotrope it has a very low temperature glide of less than 1°C

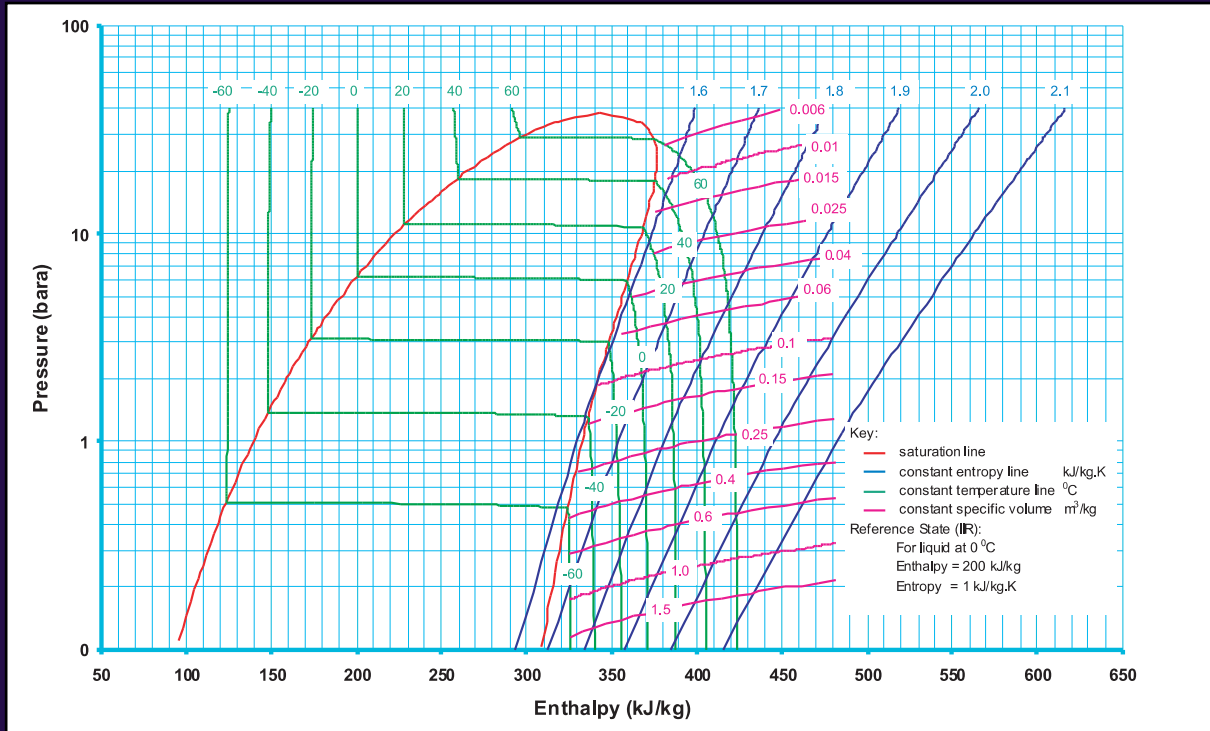
## Technical Data

Technical data including thermodynamic tables, physical properties, retrofit guidelines, materials of compatibility, questions & answers etc are available from the web site.

RS-52 Discharge Temperature



# RS-52 (R428A) Pressure-enthalpy chart



## RS-52 (R428A) Physical Properties

		RS-52	R502
Molecular Weight		101.3	111.6
Boiling Point at 1 atm	°C	-46.7	-45.4
	°F	-52.1	-49.7
Temperature glide	K	0.8	0.2
Critical temperature	°C	73.0	82.2
	°F	163.4	180
Critical pressure	bara	38.1	40.7
	psia	552	591
Liquid density at 25°C	kg/m <sup>3</sup>	1053	1217
Density of saturated vapour at 25°C	kg/m <sup>3</sup>	70.2	62.2
Latent heat of vaporisation at boiling point	kJ/kg	189.2	173
Cp at 25°C and 1 atm	kJ/kg.K	0.8737	0.6914
Cv at 25°C and 1 bara	kJ/kg.K	0.7846	0.6112
Cp at 25°C and 1 bara	kJ/kg.K	0.8735	0.6912
Cp/Cv at 25°C and 1 bara		1.113	1.131
Vapour pressure at 25°C	bara	12.68	11.5
	psai	183.9	167
Vapour viscosity at 25°C and 1 bara	cP	0.01225	0.01288
Liquid viscosity at 25°C	cP	0.1279	0.1425
Liquid thermal conductivity at 25°C	W/m.K	0.0658	0.0629
Surface tension at 25°C	N/m	0.00468	0.00545
Specific heat of liquid at 25°C	kJ/kg.K	1.526	1.25
Ozone Depletion Potential	ODP	0	0.34
Flammability limit in air (1 atm)	vol%	None	None
Inhalation exposure (8hr day and 40hr week)	ppm	1000	1000

(1) 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