

RS-52



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 SERVICES INC.





RS-52

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

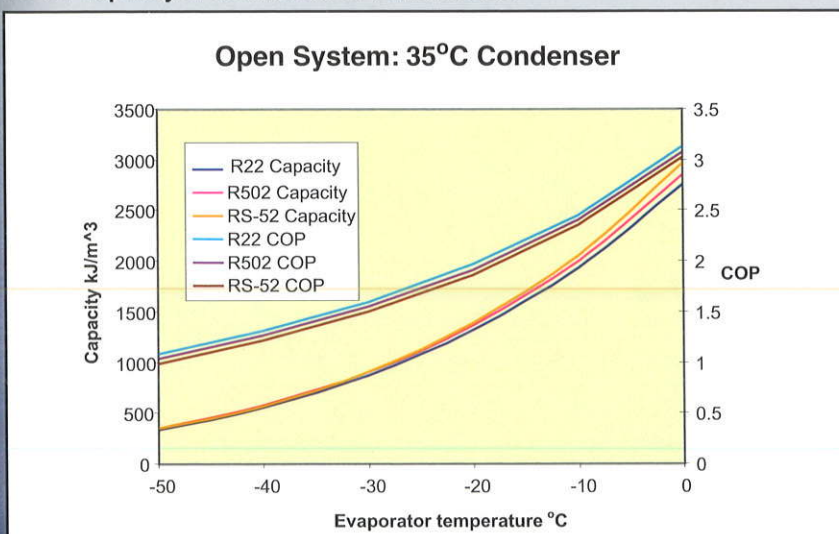
also the new synthetic polyol ester lubricants. Converting to RS-52 is a straightforward process which avoids a costly and often technically unsatisfactory retrofit (eg draining the oil from the system, replacing the seals etc).

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



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.

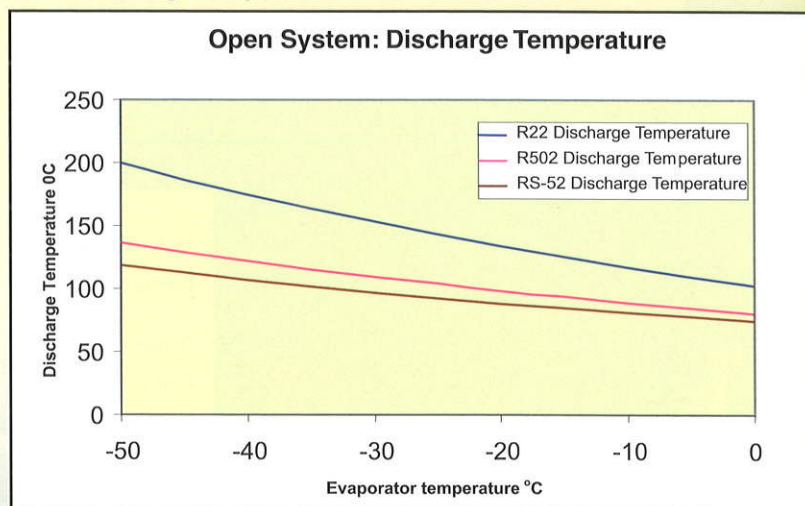
No changes to hardware

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.

RS-52 Discharge Temperature



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

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.

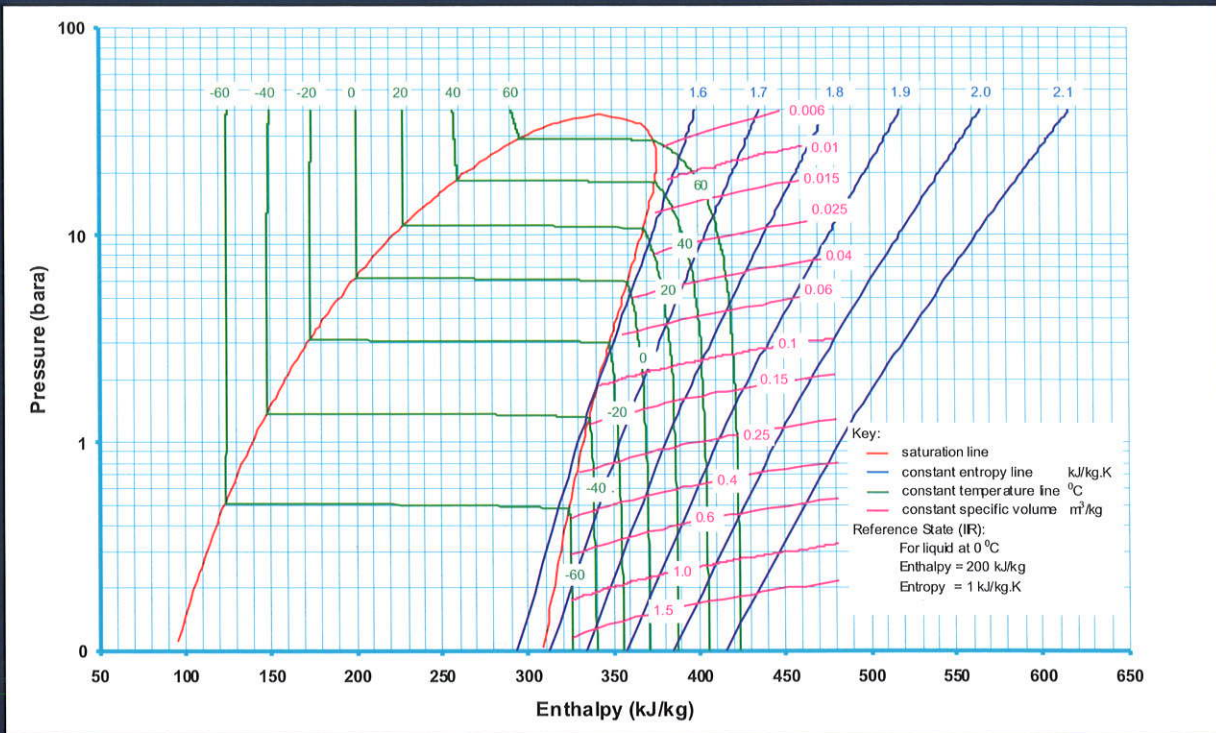
Servicing

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 Pressure-enthalpy chart



RS-52 Physical Properties

		RS-52	R502
Molecular Weight		101.3	111.6
Boiling Point at 1 atm	$^{\circ}\text{C}$	-46.7	-45.4
	$^{\circ}\text{F}$	-52.1	-49.7
Temperature glide	K	0.8	0.2
Critical temperature	$^{\circ}\text{C}$	73.0	82.2
	$^{\circ}\text{F}$	163.4	180
Critical pressure	bara	38.1	40.7
	psia	552	591
Liquid density at 25°C	kg/m^3	1053	1217
Density of saturated vapour at 25°C	kg/m^3	70.2	62.2
Latent heat of vaporisation at boiling point	kJ/kg	189.2	173
C_p at 25°C and 1 atm	kJ/kg.K	0.8737	0.6914
C_v at 25°C and 1 bara	kJ/kg.K	0.7846	0.6112
C_p at 25°C and 1 bara	kJ/kg.K	0.8735	0.6912
C_p/C_v 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



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