Honeywell | Refrigerants

Solstice® N13

Heat pump and medium-temperature refrigeration units with Solstice® N13 (R-450A)

The most energy-efficient, lowest-GWP and nonflammable alternative to R-134a

Where Energy Efficiency Meets Environmental Benefits

Solstice® N13 (R-450A) is an excellent medium pressure, low GWP, high efficiency and non-flammable refrigerant.

- Similar system operating characteristics as R-134a – **easy to use / apply**
- Compressors: lower discharge temperature than R-134a – **longer life**
- Larger operating map – **flexibility to apply**
- Higher COP and higher water temperature than R-134a – **energy savings**
- When capacity allows, it can be used to retrofit existing systems– **ease of use**
- Maintain A1 Safety Class / Non flammable – **ease of use**

PHYSICAL PROPERTIES

SOLSTICE® N13 (R-450A)	
CLASS/TYPE	Zeotropic blend
FORMULA	42%/58% (R-134a/R-1234ze)
KIND	HFC / HFO
APPEARANCE	Colourless
ODP (ODP-R11=1)	0
GWP REV 4TH/5TH IPCC	604 / 547
ASHRAE STD. 34 SAFETY CLASS	A1
ATEL/ODL (kg/m^3)	0.345
PRACTICAL LIMIT (kg/m^3)	0.319
LFL (% VOL)	Nonflammable
REACH	Registered

KEY PERFORMANCE FEATURES

- Offers a 58% reduction of GWP.
- Shows 87% theoretical capacity with similar efficiency (100%) with regard to R-134a. In field tests in different air-conditioning and refrigeration systems, reported capacity by end users was between 97% and the theoretical value.
- Small glide (0.4°C) can be easily addressed during system design. It can be used in flooded systems.

Applications

As an energy-efficient alternative to R-134a, Solstice N13 can be used in a wide variety of heat pump and medium-temperature systems, including

- DX medium-temperature refrigeration
- Primary stage of CO_2 cascade systems
- Heat pump tumble dryers
- Heat pump water and space heaters
- Air-cooled and water-cooled chillers
- District heating and cooling
- Vending machines and beverage dispensers

Performance

Supermarket trials held across Europe in countries such as UK, France, Spain, Germany and Italy confirm Solstice N13 offers similar performance as R-134a.

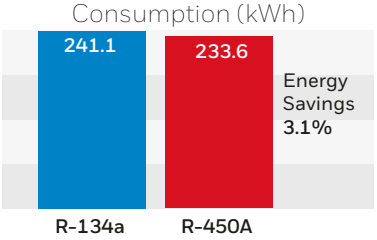
Safety and Storage

Honeywell recommends reading the Material Safety Data Sheet (MSDS) before using the product. Solstice N13 (R-450A) has similar storage and handling requirements to R-134a in bulk and cylinder, since according to the compressed gas classification it is nonflammable.

Independent Studies

In heat pump and supermarket trials conducted in various European countries, Solstice N13 demonstrated over 3% lower energy consumption. The tests were conducted by Tewis, one of the leading energy consulting firms.

Energy savings



Materials compatibility

Honeywell does not recommend the use of chlorinated solvents to clean refrigeration systems or components.

Desiccants

Desiccant driers compatible with Solstice® N13 are commercially available.

Individual drier manufacturers should be contacted for specific recommendations.

Lubricants

POE (polyol ester) oil is recommended for use with R-450A.

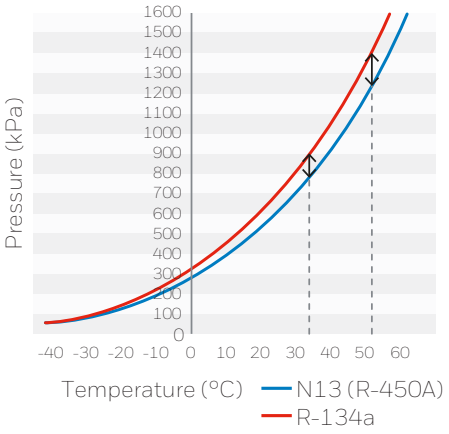
Compressor manufacturers typically qualify specific lubricants for use with their products. Users should check with the equipment manufacturer for the recommended lubricants for their system.

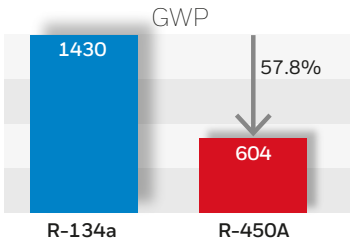
Plastics and elastomers

Solstice N13 is compatible with most common materials. Since there are many different grades and formulations of these materials, we recommend that compatibility testing be performed on the specific grade of materials under consideration and at the conditions of use when designing new systems. Customers should consult the manufacturer or conduct further independent testing.

Leaks and leak detection

If a large release of Solstice N13 vapour occurs, the same measures as with R-134a need to be taken. Hand-held leak detectors can be used for pinpointing leaks. For monitoring an entire room on a continual basis, leak monitors are available. Leak detection is important for protection of those in proximity of the system, refrigerant conservation, equipment protection and performance, and reduction of emissions. Customers should consult the equipment manufacturer for appropriate detectors.



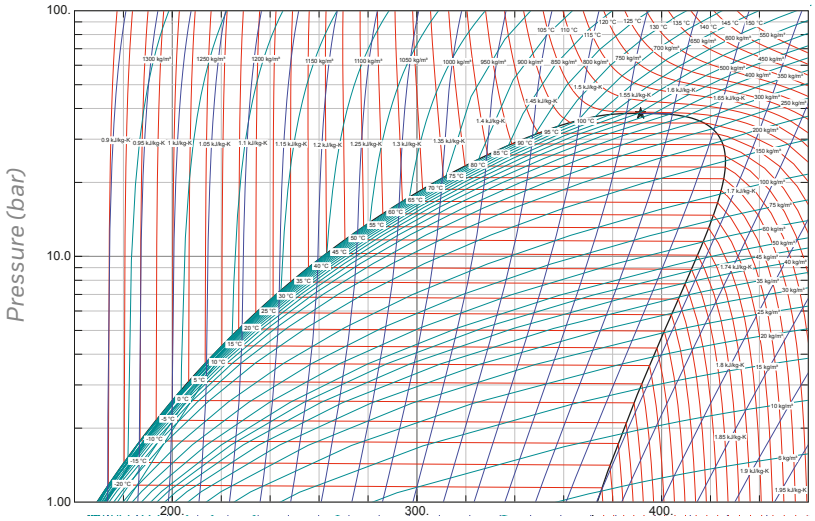


PRESSURE AND TEMPERATURE

P (1)	LT °C (2)	VT °C (3)
100	-23.7	-23.0
200	-7.0	-6.3
300	4.1	4.7
400	12.6	13.2
500	19.6	20.2
600	25.6	26.2
700	30.9	31.5
800	35.6	36.2
900	39.9	40.6
1000	43.9	44.5
1100	47.6	48.2
1200	51.0	51.7
1300	54.3	54.9
1400	57.3	57.9
1500	60.2	60.8
1600	63.0	63.6
1700	65.6	66.2
1800	68.1	68.7
1900	70.5	71.1
2000	72.9	73.4
2100	75.1	75.6
2200	77.2	77.8
2300	79.3	79.8
2400	81.3	81.8
2500	83.3	83.7
2600	85.2	85.6
2700	87.0	87.4
2800	88.8	89.2
2900	90.5	90.9
3000	92.2	92.6
3100	93.8	94.2
3200	95.4	95.7
3300	96.9	97.3
3400	98.5	98.7
3500	99.9	100.2
3600	101.4	101.6
3700	102.8	102.9
3800	104.1	104.2

(1) Pressure (absolute) kPa
(2) Liquid (bubble) Temperature °C
(3) Vapour (dew) Temperature °C

PRESSURE AND ENTHALPY SOLSTICE® N13 (R-450A)



Enthalpy (kJ/kg)

"Our aim was to successfully trial the new HFO blend N13 in a flagship store and to prove its operational and energy saving credentials. The results speak for themselves."

Jean-Michel Deroo, Groupe Auchan

"Solstice N13 is a near drop-in replacement for R-134a, it was a quick and easy changeover with no additional engineering investment required."

Ronald Voglewede, Whirlpool

Available tools

Simulation software

Honeywell's GenePro Software – for refrigerants modelling – allows you to simulate your system with the right refrigerant and export the results to Excel. It now includes all the latest HFO blends, so you can compare performance of multiple refrigerants, learn the line sizing and many more – all for free. It is available in English, German, Spanish, Portuguese and Italian.

Download the software from **http://www.honeywell-refrigerants.com/europe**

Smart phones apps

Download **Honeywell PT Chart Refrigerants EU applications** for **iOS and Android** free.

Available on the App Store

ANDROID APP ON Google play

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