

Climalife Contact #11

THE EUROPEAN MAGAZINE FOR CLIMATE
CONTROL SYSTEM PROFESSIONALS

January 2017



NOW



Next



Later



R-404A, Retrofit now
for peace of mind in 2018!

REGULATION
KIGALI AMENDMENT

REPORT
THE R-404A SUBSTITUTION
TRAIN IS ALREADY ON ITS
WAY

PRODUCTS
SOLSTICE® L40X

EVENTS
SCHEDULE OF FAIRS,
CONFERENCES, EXHIBITIONS,
TRADE SHOWS

CASE STUDY

Makro retrofit from
R-404A to R-448A in
Leganés, Madrid
p.5



PROCESS

The Mobile App
used daily by
refrigeration
engineers
p.12-13

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Price: 2,50 €



R-404A: retrofit now for peace of mind in 2018!



2016 ended with relatively few installations in Europe being converted, despite regulatory obligations that will be imposed in the near future. As you know, in 2018, regulations will set ambitious limits with a reduction of more than a third in the quantities of

HFCs placed on the market, in order to reduce the impact on global warming. Therefore, our industry is faced with a major challenge which we must meet together, to progressively eliminate refrigerants with a high GWP from existing systems, such as R-404A and R-507A, to prevent availability problems which could arise very quickly. The consequences of this could be serious, even critical, for some companies and their systems where it is essential for the smooth operation of the cold chain.

We should be aware that the situation is quite different from the situation we experienced

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seven years ago when R-22 was discontinued. The time scales are much shorter. Bans by type of application did not exist previously, nor did the equivalent tonne of CO₂ quota mechanism. We can meet this major challenge using new technology which allows us to stop using fluids with a high GWP and adopt new refrigerants on the market that have low environmental impact. The best policy is to anticipate and plan to convert. Our staff are available to assist you in finding the best solutions, both in terms of energy and ecological efficiency as well as cost and competitiveness.

In this issue, find out about latest achievements and tools available to assist you in making the change. On behalf of everyone at Climalife, I wish you and your families a happy new year.

Happy reading!

Pierre-Etienne Dehon
Chairman and Managing Director

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2017

The R-404A substitution train is en route, don't miss it. Climb on board now!

The R-404A substitution train is already on its way

HOW DO I MANAGE THE IMPLEMENTATION OF THE NEW REFRIGERANTS AND WHICH SOLUTIONS SHOULD I CHOOSE?



Interview with Jean De Bernardi,
European Technical Manager- EMEAI LGWP Refrigerants at Honeywell.

Could you explain to us briefly why you have developed a number of molecules over recent years?

JDB: Honeywell anticipated changes to the market and started research and development more than 15 years ago. The aim was to find molecules with the lowest possible GWP. Among the thousands of molecules assessed, only three were chosen as being the best compromise in terms of efficiency, safety and the environment. These three HFO molecules are R-1234yf, R-1234ze and R-1233zd. Their main aim is to replace R-134a in cars, liquid cooling systems (including centrifugal chillers) and in heat pumps. These three pure low pressure and low capacity molecules, must be mixed with HFCs if we want to obtain so-called drop-in fluids for existing solutions.

Why have so many products appeared on the market?

JDB: All refrigerant producers are trying to find direct replacement solutions by creating blends, so each has created their own formula, all with temperature glides of varying degrees. There is a feeling of a proliferation of products on the market but we need to look at what is actually being marketed. There is a huge difference between research and what actually comes onto the market. If we take R-404A replacement solutions, i.e. non-flammable HFO/HFC mixes, there are

only two solutions available currently including Solstice® N40 (R-448A) from Honeywell.

Why this new alternative when you have already launched Performax® LT as a replacement solution for R-404A?

JDB: Performax® LT (R-407F) is a very good product, it is the HFC with the lowest GWP and is the most efficient replacement for R-404A. The implementation of taxes on HFCs in some European countries (e.g. Spain) has led to a real economic need to develop a new mix with an even lower GWP. Solstice® N40 is the solution with the lowest GWP on the market (1387).

Besides the GWP of the fluid, are there technical differences between R-407F/R-448A?

JDB: These two products differ by their composition and their GWP but are very close in terms of performance, capacity and energy efficiency. R-448A has the advantage of generating the lowest compressor discharge temperatures and usually makes it possible to eliminate liquid injection.

But in practical terms, is there a future for both these very similar fluids?

JDB: R-407F and R-448A can be used in all new commercial and industrial refrigeration systems without restriction, except from 1st January 2022 for so-called should be multi-pack or hermetically-sealed systems.

The Kigali amendment

Over the past few years, the increase in the quantity of HFCs on the market has been fed by growing demand for refrigeration equipment particularly in developing countries that have a growing middle class population, as well as demand from hot countries.

On 15 October 2016, the 197 parties to the Montreal Protocol signed the Kigali amendment to gradually reduce the use of hydrofluorocarbons (HFCs) around the world. This agreement will strengthen the objective of the Paris Agreement target that aims to keep global warming below 1.5°C to 2°C by 2100. The amendment was welcomed by all European refrigeration and air conditioning operators.

The Kigali agreement - like F-Gas II, initiated by the European Union - also includes the phase down of HFCs based on CO₂ equivalence. The schedule foresees a gradual reduction in the use of HFCs by the parties, which are divided into three categories that have different starting points and reduction stages:

- the first group comprises "developed nations",
- the second group comprises "developing nations",
- the third group is made up of India, the Gulf states, Iran, Iraq and Pakistan.

By 2048, all of the countries are expected to consume no more than 15% to 20% of what they currently consume (based on CO₂ equivalence). The deadlines are legally binding and may be revised or brought forward for all countries in light of technological progress.

NB: 16 countries, including the United States, Japan, Germany plus France, and 19 private donors/organisations, pledged up to \$80 million of aid (€71.5 million) to help developing countries in this transition process. The funding of the transition process, estimated at several billion dollars, will be discussed again at the end of 2017 as part of the Montreal Protocol.



In addition, it is important to underline that they have no maintenance prohibition date. Both products have a real future. Nowadays, choosing a product is based more on economical than technical grounds and depends on the end customer's circumstances. R-407F has a better quality/price ratio when compared with R-404A, and with more than 15,000 supermarkets retrofitted around the world, it is a technical success. R-448A has a more environmental image with its lower GWP, 2000 supermarkets already use it.

How do we handle the implementation of these new fluids?

JDB: As I mentioned earlier, all new "drop-in" fluids have a temperature glide. This glide must be taken into account as it provides a significant efficiency gain to the system. It is necessary to look at each setting impacted by the glide, for example using average temperatures at the heat exchangers (condenser and evaporator), instead of the usual dew point with R-404A, consider the dew point for superheating and boiling point for sub cooling, etc. Then simply apply refrigeration good practice learnt in all good technical colleges.

The question of product distillation in the event of a leak is often mentioned, what is this?

JDB: This is an important theoretical question. In the absence of significant experimental research on the subject, Honeywell has carried out studies and produced publications which show that in the event of a 20 to 30% leak, the solution is simply to recharge with new product. The system then regains all its performance with regard to capacity. Retrofitting existing installations containing R-404A with these solutions is a very simple conversion process. R-407F and R-448A have been approved by compressor engineers and are listed in all equipment selection software produced by the major brands on the market.

At Chillventa, the international refrigeration fair held last October, you launched Solstice® L40X fluid, why?

JDB: The goal for Honeywell is to have a replacement for R-404A with a GWP less than 150 over the long term. Solstice® L40X (R-455A) was mainly developed to meet requirements for low-temperature hermetically sealed systems, condensation units and built-in units. Indeed, the sealed piston compressor technology mostly used in this equipment has a major problem: they cannot cope with additional overheating at the compressor discharge which can impact service life. We therefore worked jointly with the manufacturers to obtain a fluid with a capacity similar to R-404A with a GWP of 148 and a very low discharge temperature. Solstice® L40X is almost non-flammable, classified A2L and is analogous to a "super propane". The other essential advantage over propane is that the charge of Solstice® L40X is approximately 12 times greater using the new EN378 standard, just published.

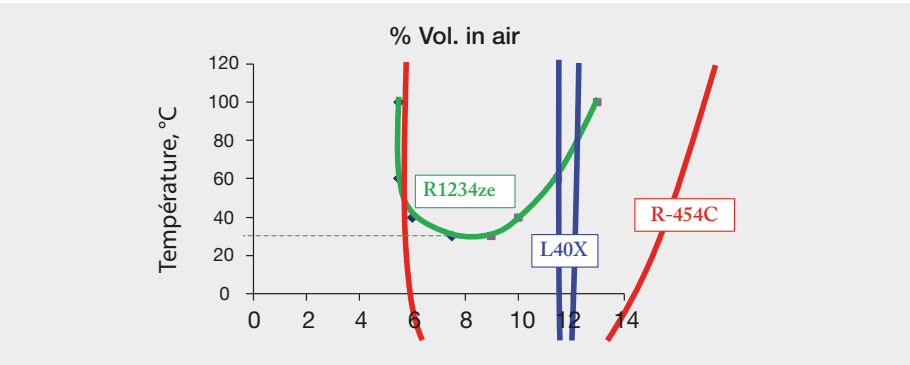
With a GWP so low, can R-455A be used in other systems such as multi-pack systems from 2022?

JDB: Nowadays, there are a number of innovations taking place at the same time with regard to refrigerants, compression techniques

and system designs. To replace R-404A, we envisage Solstice® L40X also taking its place within new designs such as water loop systems in supermarkets with built-in units or so-called 3 in 1 systems already used for HFOs.

Returning to the flammability of this new fluid, can you explain why you consider it to be an almost non-flammable product?

JDB: Solstice® L40X (R-455A) contains 3% CO₂. We have added it in order to increase the capacity of the fluid and reduce flammability. If we look at the flammability range, defined between the lower and upper flammability limits, there is a difference of only 1.1% (see blue curve on the attached chart). There is therefore little chance of ending up in this situation and if so, combustion in the air will take the mix out of the flammability zone very quickly. Generally speaking, we observe that the HFOs or A2L classified HFC/HFO blends have a tendency to protect the systems when compared with A3-classified hydrocarbons. Another example: a concentration 10 times greater and about 250,000 times more energy is needed to ignite R-1234ze relative to propane. HFOs have a bright future! The R-404A substitution train is on its way - don't miss it. Climb on board now!



All competitor data given in the above table has been extracted from submission reports produced as part of ASHRAE

	Flammability class	LFL (%)	UFL (%)	Burning velocity (cm/s)	Heat of combustion (MJ/kg)
L40X (R-455A)	A2L	11.8	12.9	> 1.5	10.15
DR7 (R-454A)	A2L	6.3	ND	2.4	10.04
DR3 (R-454C)	A2L	6.2	15*	2.5	10.51
ARM20a (R-457A)	A2L	6	ND	6.3	11.23

ND: not determined - *: graphic viewer

COMMERCIAL COOLING | WHOLESALE DISTRIBUTION



Makro retrofit from R-404A to R-448A (Solstice® N40) in Leganés (Madrid)

DIRECT, QUICK, SAFE AND PROBLEM- FREE RETROFIT FOR BETTER SUSTAINABILITY AND CARBON FOOTPRINT

Makro, a subsidiary of the Metro Group, is the leader in wholesale retailing in Spain, with 37 business centres, over 2,700 employees and close to one million registered users. Makro's customers are mainly independent companies from HORECA sector.

To reduce their climate impact – considering that the cost of energy is increasing worldwide – and to lower operational costs, Makro performs efficient practices to ensure their business is a central pillar in their commitment to improving sustainability. To help meet their targets, several measures are currently being implemented to reduce energy needs. These include the installation of best-in-class technologies, as well as programs of training and empowerment of employees. Makro is in continuous renovation and adaptation to ensure the use of latest technologies that help to reduce carbon footprint.

Catri is a major contractor in Spain which has more than 40 years of success in refrigeration services, providing their customers with integrated solutions in industrial refrigeration, service, maintenance, and turn-key projects.

The retrofit from R-404A to R-448A in the Leganés store provided many benefits, including:

- R-448A shows improved performance compared to R-404A
- Lower energy consumption in both low and medium temperature systems
- A reduced GWP – 66% lower than R-404A, giving lower emissions as well as lower maintenance costs due to the lower GWP tax in Spain
- Retrofit was completed without any incidents, thanks to being a direct replacement of R-404A, making the change safe, easy and more efficient for the technicians.

Implementation: a perfect execution of a well-designed plan

In their search for a reduction of carbon footprint, Makro achieved two great goals in the past in this same store:

- Installation of doors and lids in MT and LT cabinets. This allowed for the de-commissioning of one out of the four original central racks, as consumption was reduced; maintenance costs were also reduced.
- A strong focus on refrigerant leaks at the store resulted in a significant reduction to a level of only 6%.

Success

experience

José María de Santos
Refrigeration Manager,
Makro,

"N40 (R-448A) performance is good; and set points were achieved immediately after retrofit. We will continue to monitor and measure energy consumption for a long period to have reliable data about savings and consider them for future plans."

Rafael Matarranz
Manager,
Catri,

"It was a real challenge to make the conversion in the planned time, working shifts and with up to 60 technicians in the plant. The easy handling of R-448A, the fact that it is a direct replacement and the excellent operational strategy defined for the job together with Makro, helped in minimising the time."

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Makro logistics centre, whilst the products from the low temperature cabinets and walk-in freezers were kept in 2 x 13m long refrigerated trucks. Simple adjustment of all refrigeration controls saw the expansion valves closed by one turn, with superheat settings adjusted to meet the demands of the system.

Even though the discharge temperature of R-448A is very close to that of R-404A, due to the extreme peak temperatures in summer Makro decided to add extra mitigation in both low and medium temperature with ChillBooster in both condensers.

Next steps

Makro and Catri continue to work during the coming months on system optimisation. Evaporating temperature is continuously monitored to keep it as high as possible and achieve the lowest possible energy use, with an expected level of 2-3% savings per degree Celsius.

After the success of this store in Leganés, the Makro store in Santander (North of Spain) has now also been retrofitted from R-404A to the HFO blend R-448A in May 2016.



The refrigeration system has now been converted to achieve higher efficiency and further reduced carbon footprint:

- Original oil management system, based on Venturi effect, has been replaced by active systems with oil separators and receivers with individual control of oil through the compressor
- Microchannel technology introduced through V-shaped condensers with higher efficiency and a 15% lower refrigerant charge
- Introduction of floating condensing and evaporating control
- Inverter technology introduced for each rack's master compressor.

The refurbishment project took place from 23rd to 27th March, 2016, and involved a total crew of 60 people working on all aspects relating to refrigeration, component replacement and electrics. Catri worked shifts continuously during those days.

Refrigerated stock from the medium temperature cabinets and cold rooms, were moved to a nearby

Key Results

■ A successful conversion for Makro store

Key results:

- Simple retrofit, quick, problem-free and safe thanks to the similar characteristics of R-448A versus R-404A.

- Temperature set points were achieved very quickly, after the re-start of the installation.

- After conversion, a lower energy consumption was observed in both low and medium temperature systems.

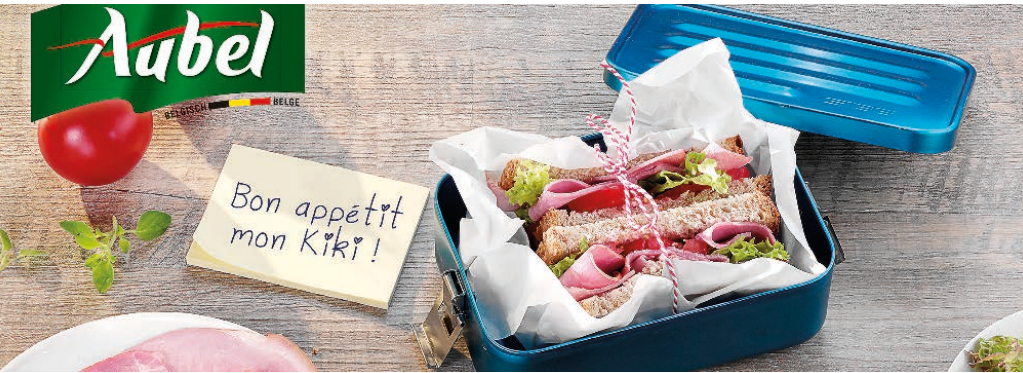
- R-448A (Solstice N40) has a GWP 66% lower than R-404A, resulting in reduced emissions and lower cost of maintenance (lowest possible tax/GWP than any other A1 alternative to R-404A).



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Greenway® Neo / CO₂ combination R-22: a first for installer HENKENS Frères s.a.

IN RECENT YEARS, THE AUBEL MASTER BUTCHERS HAVE COMMITTED TO A SUSTAINABLE DEVELOPMENT POLICY AND DECIDED TO RENOVATE THEIR REFRIGERATION SYSTEM BY INVESTING IN A NEW INDIRECT COOLING SYSTEM.



Positioned at number 3 in the Belgian charcuterie market, the Detry family company has a motto: "Stay true to the product by giving priority to the taste and quality of ingredients". Aubel is the flagship brand of this company founded in 1963. According to Detry, its quality comes from good rearing and feeding conditions, respect for the animal, the know-how of the people, listening to consumers, and regular investment management. The time had come to replace their R-22 refrigeration system for the freezer and freezing tunnel on their main production site in Aubel, Belgium.

A successful first experience for Henkens Frères

Detry called on its installer Henkens Frères, a multi-faceted company offering its region highly respected experience in areas such as refrigeration, heating equipment, and industrial boilerwork for the food industry, to install a CO₂ system to be in line with the company's strong values. After discussions with its client, Henkens recommended an innovative, durable solution, opting for an Advansor CO₂ transcritical system with Greenway® Neo plant-based heat-transfer fluid, formulated and distributed by Climalife, to ensure defrosting in synergy with energy recovery for domestic hot water production.

Implementation without stopping the Detry plant's production

The 180 kW Advansor transcritical system is sheltered on the roof. It is equipped with a gas cooler with a Danfoss variable frequency regulation system operating at -38°C / +40°C. Loaded with 250 kg of CO₂, the system supplies a 4,800 m³ freezer to store 500 tonnes of meat and a cooling tunnel with three deep freezers. In total, seven GÜNTNER evaporators are installed. They have the advantage of having a double circuit, including one dedicated to the Greenway® Neo heat-transfer fluid for defrosting.

"In addition to energy recovery, the appeal of this system is the production of a hot Greenway® mass for on-demand defrosting of the seven evaporators. Twice every 24 hours, sufficient energy is accumulated in a 750 L vessel. The CO₂ easily permits high temperatures and therefore facilitates the storage of energy using the Greenway at 50 / 60°C; a three-way valve regulation system redistributes Greenway solution at 25°C for adapted defrosting", explains Joseph Toussaint, maintenance manager at Henkens Frères.

The installation was put in place alongside the old system to avoid stopping production. In total, 2,200 litres of Greenway® Neo is distributed across the entire network.

Solution

■ Greenway® Neo / CO₂ the sustainable alternative

experience

Gérard Struvay,
Refrigeration Manager
Henkens Frères

"Our client absolutely wanted a CO₂ system as part of an environmental approach. More generally, we are putting in place 'Ammonia and glycol water' systems in our industrial processes. We therefore sought the best solution to meet these environmental requirements. For the past few years, we closely monitored the technological developments in CO₂ to be in line with the necessities of changing refrigerants among our clients by training three of our technicians in R-744."

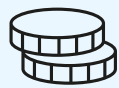
"We've seen some experiences on the market that have been difficult to say the least. Building on our experience of hot gas defrosting with R-22, NH₃ and hot water defrosting with heat recovery, we ultimately chose water defrosting with an exchanger and Greenway® Neo -55 because it is the only organically sourced heat-transfer fluid approved for 'food contact' with the ability to drop to -50°C with proper viscosity. We believe, under current circumstances, that hot gas defrosting with CO₂ was not appropriate."

HENKENS FRÈRES S.A.:



110
Number of employees

Business: Industrial refrigeration, heating, heat exchangers, boilerwork.



17
million euros (in 2015)

Location: Henri-Chapelle (Belgium).



New Intermarché in Marseille opts for R-448A / CO₂ cascade system.

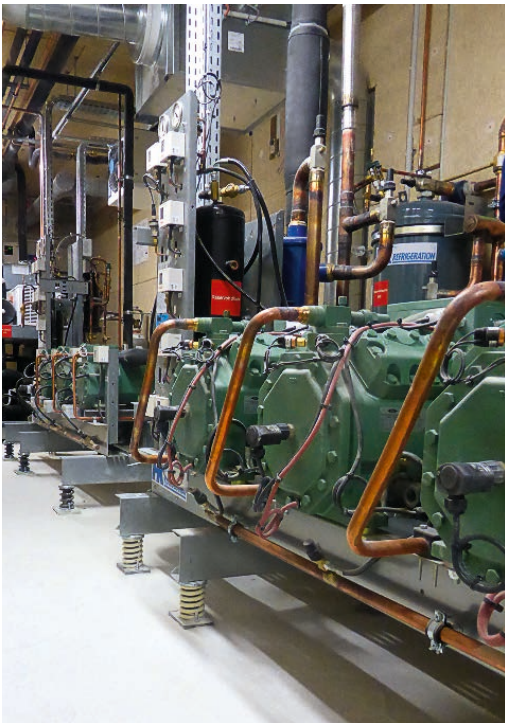
A SAFE, LONG-LASTING AND ENVIRONMENTAL SOLUTION,
TO DEAL WITH THE COMPLEXITY OF THIS LOCAL STORE.

Situated in Marseille's 5th borough; a densely populated area, the new city-centre store aims to offer a large sales area of 900 sq. m where as many products can be found there as in an Intermarché brand hypermarket. It has been created on the ground floor of a new property site with fifty apartments on seven floors. This project, initiated by Intermarché, took on Laurent Dubuc and his partner Stéphanie Maurin as managers on 1st March 2016.

Carefully selected criteria to satisfy customers and preserve the environment
The store owners wanted to provide real comfort for their customers: they made the choice to have wide aisles to provide a sense of ease of movement, to install closed backlit Carrier cabinets and to install LED lighting over the entire area of the store, so as to reduce electricity consumption and create a pleasant environment for consumers.

For the cold installation, their requirement, above all, was to call upon competent professionals and achieve a reliable and durable technical solution that provided a good return on investment. Before the project started, they contacted the fluids design consultancy run by Maxime Maisonnave and selected FCS 84 to do the installation work. "There was a real synergy between these two companies, on the one hand their technical skills and the solutions put forward and on the other hand their willingness to help us and listen to our requirements," says Laurent Dubuc.

The R-448A / CO₂ cascade system meets requirements
The project was complex, given the layout of the building. You have to remember that the machine room is on the first floor and that the condensers had to be installed on the seventh floor roof and still comply with the developer's noise and visual restrictions. 110 metres of pipework had to be installed. An acoustic study was then conducted by the Masonnave design consultancy before work could



begin and be subsequently approved by the Buildings Inspectorate to certify that the installations would not cause any nuisance to future tenants / owners of the building. A transcritical CO₂ system was selected, given the lack of access to the pipework between each floor and the high pressure applied to the fluid.

The choice was based on a cascade installation with the new Solstice® N40 fluid for the MT cooling. The R-134a and R-450A fluids were eliminated, given the significant cost associated with the size of the pipework and the purchase of the central unit. The clever use of the two fluids R-448A / CO₂ and their low environmental impact allowed the installer and design consultancy to go for a long-lasting solution.

Solution

■ The Solstice® N40 (R-448A) solution: a fluid of the future

"N40 was a choice made jointly with FCS 84 after we both studied the information on this new product, provided by Josiane Marin, Climalife's Key Accounts Manager. We selected this fluid for its thermodynamic properties which are the closest to R-404A from a density and discharge temperature point of view and since it is approved by manufacturers," Maxime Maisonnave reminded us.

"N40 is a fluid with a low GWP, no regulatory constraints and easy to use, plus we have real feedback from experience," emphasised Alain Griotto, FCS 84 Manager.



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A cooling installation produced using custom equipment
The cooling installation supplies a LT cold room for the storage of frozen foods, five MT cold rooms for fruit and vegetables, waste, the drive-through (storage of customer orders) and all the store's refrigerated cabinets. To meet the constraints imposed, choosing the right cooling equipment was essential. The two central units are made by HK Refrigeration and are located in the technical room on the first floor. They are fitted with a Siemens electrical trip controlled by Carel PLCs. The main LT unit was delivered in kit form and assembled on site, due to its size. The semi-hermetically sealed compressors are Bitzer branded to limit vibration as much as possible. In addition, anti-vibration mounts are fitted on the Luve Contardo helical condensers chosen for their low

noise and small size. Special smoke extraction ducts have been installed. Four mini Daikin VRV units with R-410A control the air conditioning on the sales floor and in the offices, once again necessary because of the limited space on the roof. The installation was commissioned on 25th October 2016 after two months of site work, monitored closely by Nicolas Pique, FCS84's Contracts Coordinator. Supervision from a PC allows the installation's operation to be monitored and controlled remotely. The Intermarché store opened its doors on 1st November 2016 as planned, thanks to the efficient cooperation between all parties involved on site and regular monitoring by Atelier AB at an architectural level. The budget for the entire refrigeration and air conditioning installation, including refrigerated cabinets, was around €400,000.

Description of the installation

	MT cooling – R-448A	LT cooling – CO ₂
Cooling capacity	HK Refrigeration unit 97 kW	HK Refrigeration unit 21.03 kW
Power consumption	38.6 kW	5.73 kW
Operating conditions	-8°C / +46°C	-35°C / -5°C
Condensing capacity	Luve Contardo condenser 2 x 75 kW	HK Refrigeration evaporator condenser 2 x 27 kW
Refrigerant fluid	Solstice® N40 (R-448A)	CO ₂ (R-744)
Charge in the installation	250 kg	72 kg
Compressor	4 Bitzer 4PES-12Y semi-hermetically sealed compressors	3 Bitzer 2HSL-3K semi-hermetically sealed compressors
Compressor Refrigeration Oil	20 litres Mobil EAL Arctic	6 litres Bitzer BSE 60 K

Success


■ Electrical consumption lower than previous estimates

"Above all, a good cooling installation is a sign of a top quality job. If you allow the technician time to do his work properly, i.e. to adjust for superheat, check that the evaporator is correctly filled, in particular, then there's nothing to worry about." And correct settings mean that you save on electricity consumption," says Alain Griotto.


"I am extremely satisfied with the choice of fluids, since we're using a technology of the future which won't need changing for the next few years and which will contribute to a significant reduction in electricity consumption, in addition to LED lighting all across the store. After we were open for a month, our bill was €2600, well below our forecast. If we compare ourselves to a store of a similar size in Marseille, we're saving more than 50%!" enthused Laurent Dubuc, owner of the Intermarché.

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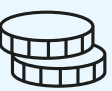
FCS 84 IN BRIEF:



1990
In business since



40
Number of employees



8
million euros in 2016

Business: Commercial and semi-industrial cold, Climate Control, Air Conditioning.

Location: Sarrians, (84- France).



From left to right: Alain Griotto, Manager of FCS 84, Laurent Dubuc and Stéphanie Maurin, Owners of the Intermarché, Nicolas Pique, Contracts Coordinator FCS 84, Maxime Maisonnave, Manager Ingénierie Maisonnave, Josiane Marin, Key Accounts Manager, Climalife.

INGENIERIE MAISONNAVE IN BRIEF:



2011
In business since



2
Number of employees



€150,000
(in 2016)

Activity: Technical design consultancy Fluids and Commercial Cooling, Fire Protection, Electricity.

Address: Jonquières Saint Vincent, (30 - France).

Implementation of Greenway® Neo for fermentation of sparkling wines

SMEF AZUR HAS CHOSEN THE NEW GREENWAY NEO HEAT-TRANSFER FLUID TO CONTROL THE FERMENTATION TEMPERATURE AT RIVAROSE WINES AND TO IMPROVE THE ENERGY EFFICIENCY OF THE PRODUCTION PROCESS.



Founded in 1909, Rivarose does not just sell sparkling wines. It also has a processing business that turns “still” wines into sparkling wines by adding sugars and yeasts, that ferment by producing carbon dioxide.

Depending on the desired result, Rivarose uses a traditional fermentation method in bottles or a faster method in vats.

Whatever the method used, temperature control is imperative

When the processing of “still” wine is done in bottles, the disgorging step (removal of yeasts after fermentation) can be tricky. To ensure that it goes smoothly without too many losses, the yeasts are concentrated in the neck of the bottle, and the deposit is frozen at -20°C by immersing the neck of the bottle in a glycolated water bath.




Rivarose

is the oldest and largest sparkling wine house in Provence. This independent company was bought out in 1998 by a family group from Burgundy: Veuve Ambal.


Located in Salon-de-Provence, in Bouches-du-Rhône, South of France, it employs 35 people and produces 5 million bottles of sparkling wines each year, including 3.5 million bottles after fermentation in vats. 15% of the production is exported to the United States.




SMEF AZUR IN BRIEF:



1984
date created



45
workforce



22
million euros
(2015)

Business: Specialist in cooling, air conditioning, and management of technical assets.

Location: La Fare-les-Oliviers, Bouches-du-Rhône (13).

Greenway® Neo
30%
decrease in
pressure loss

Greenway® Neo
20%
reduction
in energy
consumption



Josiane Marin, Climalife Key Accounts Manager, and Jean-Pierre Leplatre, SMEF AZUR Technical Director.

Nicolas Quiles, Technical Director and Oenologist in front of the gyropalettes that automatically rotate the bottles.



When the bottles are opened, the losses of wine and gas are smaller when the wine foams a little (at a low temperature).

The method of fermentation in vats is much faster but also requires rigorous control of the wine's temperature. Nicolas Quiles, Technical Director and Oenologist at Rivarose explains: “We use temperature to regulate the fermentation and lower the wine's pressure during bottling. So, when the wine reaches the bottle, it does not produce foam. At room temperature, the slightest impurity would cause the wine to react and produce foam”.

The choice of heat-transfer fluid is strategic

In 2016, Rivarose chose to consolidate its two production plants on a single site located in Salon-de-Provence. It called on SMEF AZUR, a thermal installation specialist, to review its cooling system to ensure the continuity of its process.

In its specifications, the company wished to continue to use monopropylene glycol heat-transfer fluid, one of the most commonly used fluids in the food production sector. SMEF AZUR contacted Josiane Marin, South East Key Accounts Manager at Climalife, who proposed a technological, eco-friendly alternative: Greenway® Neo. After a thorough review of all of the technical characteristics of this new organically sourced 1,3-propanediol heat-transfer fluid, Jean-Pierre Leplatre, Technical Director of SMEF AZUR, advised his client to choose this new innovative, durable solution. “As an installer, we have a duty to advise. It is important for us to monitor the technical developments and recommend the best solution. At SMEF AZUR, innovation and protection of the environment is in our genes”, explains the installer.

The low viscosity of Greenway® Neo is paying off

The Greenway® Neo fluid helps to conserve the environment and significantly reduces the energy consumption of the production site. Considering all the physical properties of the

two fluids, Jean-Pierre Leplatre notes that the viscosity of Greenway® Neo heat-transfer fluid, within the operating conditions at the Rivarose wine fermentation process, is half the viscosity of monopropylene glycol heat-transfer fluid. To provide and maintain a temperature of -20°C, monopropylene glycol has a viscosity of 80 cSt, compared with 40 cSt for Greenway® Neo.

However, the viscosity of the heat-transfer fluid has a huge impact on the energy consumption of the system! For Nicolas Quiles, “this is clearly where the advantage of Greenway® Neo lies for Rivarose”.

The company initially had a 120 kW MTA refrigeration unit, which it planned to back up with a 200 kW unit to be able to handle the increased production at the Salon-de-Provence site. The choice of the Greenway® Neo solution allows the refrigeration unit to be kept by simply improving the insulation of the pipes. “The low viscosity of this heat-transfer fluid improves circulation in the exchangers. Changing the unit is therefore not necessary. A sale was lost, but it's a win for the planet!”, explains Jean-Pierre Leplatre.

In the end, the switch from MPG to Greenway® Neo decreased pressure losses by 20% to 30% and reduces the energy consumption of all the equipment (pumps, etc.) by around 20%.

Description of the installation

- Vats holding 24,000 litres
- 20 exchangers
- MTA 120 kW refrigeration unit
- 8,000 litres of Greenway® Neo



Ultimately, thanks to the effectiveness of Greenway® Neo, this unit will not need a secondary unit.

Choice

■ **Low viscosity of Greenway® Neo**

experience



Nicolas Quiles, Technical Director and Oenologist at Rivarose

“this is clearly where the advantage of Greenway® Neo lies for Rivarose”.

■ **Fermentation during the manufacture of Greenway® Neo**

The Greenway® Neo heat-transfer fluid has a unique composition based on Susterra® propanediol by DuPont Tate & Lyle Bio Products LLC.

Susterra® propanediol is derived from renewable agricultural resources through a fermentation process entirely in line with a sustainable development approach.

+ More info on:
climalife.dehon.com/heat-transfer-fluids

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Products

R-407F (Performax LT)

Performax LT is a zeotropic blend of HFCs, intended for low and medium temperature commercial refrigeration applications. It improves upon and can replace R-404A in new and existing installations.

Linked documents

Safety Data Sheet R-407F (Performax LT) (100049400-en)

en PDF 10,5 mb

Technical data sheet R-407F (76 Kb)

en PDF 76 kb

REFERENCES

PRODUCTS AND LINKED SERVICES

Product	Packaging	Charge
7602 R-407F (Performax LT)	Cubikool®	11 kg
7715 R-407F (Performax LT)	Friostar®	18 kg
7604 R-407F (Performax LT)	52 L cylinder	47 kg
7605 R-407F (Performax LT)	448 L container	410 kg
7606 R-407F (Performax LT)	930 L container	850 kg

Read our case studies on Performax LT (R-407F):

The most ecological refrigeration system in St Margrethen uses R-407F

NEWS

Make using CO2 easier with Climalife!

Jan 11, 2017

The Mobile App used daily by refrigeration engineers

WITH THE WIDESPREAD USE OF SMARTPHONES AND TABLETS, IT'S CLEAR THAT BEHAVIOURS IN WEB USAGE ARE CHANGING ACROSS ALL ACTIVITY SECTORS.

Climalife; always at the forefront of technology, offers mobile applications for refrigeration and air conditioning professionals, each highly useful for managing cooling systems. Here are a few examples of the services offered.

Refrigerant	Deadline of use	GWP	Availability	Safety	Efficiency	Climalife Recommendations	Comments
R-407F	No limit	1825	✓	✓ A1	✓	APPROVED	Good efficiency, quick payback, reduce environmental impact
R-448A	No limit	1387	✓	✓ A1	✓	APPROVED	Lowest GWP Solution - MT & LT
R-449A	No limit	1397	✓	✓ A1	✓	APPROVED	Low GWP - MT & LT
R-407A	No limit	2107	✓	✓ A1	✓	APPROVED	
R-404A	31/12/2019	3922	✓	✓ A1	✓	!	High GWP - Not recommended
R-507A	31/12/2019	3985	✓	✓ A1	✓	!	High GWP - Not recommended

F-Gas Solutions: the mobile application for all!

F-Gas Solutions now has over 21,000 users that manage existing and future installations in the face of F-Gas regulations. Climalife wanted to go a step further by adding new functionalities to the app. Interactive links to the table of solutions for each product application and each type of equipment are now available. The links connect directly to the Climalife website www.climalife.dehon.com, just one click away from thermodynamic properties of each refrigerant, the MSDS, enthalpy diagram or product data sheet. Plus, without even leaving the web page, you can access practical case studies from across Europe for the refrigerant concerned.

Make life easier, download F-Gas Solutions if you haven't already done so!

Download on the App Store

Get it on Google play

PROCESS

13 | PROCESS | January 2017 | Climalife contact #11

Mantooth™: for pressure/temperature readings, calculation of superheat and sub-cooling

Created to simplify pressure and temperature checks and measurements in refrigeration and air conditioning systems, the Mantooth™ electronic manifold mobile app calculates the systems superheat and sub-cooling. Its ergonomic design displays this information instantly and in colour on iOS and Android devices.

The application allows you to save all pressure and temperature measurements taken, allocate them to a location and/or a system and send them by email, optimising the follow-up of your maintenance work.

The new version of the application, which can be downloaded free of charge from the Apple Store and Google Play, includes 113 refrigerants, including the new HFO fluids and hydrocarbons such as R-290 or R-600a. It is available in five languages; English, French, German, Spanish and Dutch.

The Mantooth™ electronic pressure gauge is used to connect to systems. With Mantooth™, you'll never need a manifold or hose again because your phone will be doing all the work through a Bluetooth® connection. It is available from Climalife as a single, duo or a double pressure gauge with a case.

R-407F

LOW PRESSURE

3.1

Unassigned

3.31 Min 3.31 Avg 3.31 Max

HIGH PRESSURE

10.0

Unassigned

10.0 Min 10.0 Avg 10.0 Max

SATURATION TEMP

-7

Unassigned

SATURATION TEMP

18.5

Unassigned

LOW TEMP

21.2

Unassigned

HIGH TEMP

21.2

Unassigned

SUPERHEAT

CALC TARGET

Unassigned 28.1

SUBCOOLING

CALC TARGET

Unassigned -2.7

LOG: 00:00:03

DISCARD

SAVE

Climalife P/T Slider: your digital pressure / temperature ruler containing all the refrigerants available on the market!

climalife

R-407F

Temperature

Bubble

°C -16

Pressure

Relative

Bar 2.62

Temperature °C

Pressure Bar

Properties

GWP 1825

Lubricant Type POE

Safety class A1

DETAILS →

The famous ruler for refrigeration and air conditioning is now available as a mobile app. The new P/T slider app from Climalife provides temperature and relative or absolute pressure data for all refrigerants on the market.

In addition, the app details refrigerant compositions, temperature glide, boiling points and molar masses. Available in seven languages, on Apple and Android devices.

Download it for free!

Download on the App Store

Get it on Google play

NEW

REFRIGERANTS

SOLSTICE® L40X, the new fluid with a GWP lower than 150, to replace R-404A

The new Honeywell R-455A refrigerant, a mixture of R-1234yf, R-32 and CO² marketed under the name of Solstice® L40X, has been perfected to assist the commercial refrigeration sector in complying with the 2022 and beyond F-Gas regulations, by replacing low temperature refrigerants that have high GWP potential, such as R-404A. In fact, from 1st January 2022, the use of refrigerants with a global warming potential (GWP) higher than 150 in hermetically sealed cooling systems in commercial use will be banned.

One of the sectors most affected by this new restriction will be OEMs supplying retail stores and supermarkets with standalone, small charge on-board cabinets, refrigeration condensing units and monoblock systems for cold rooms and freezer rooms.

Studies have shown that this refrigerant provides efficiency gains of 6% or more in LT applications and over 10% for MT, along with a better COP than R-404A. R-455A is categorised A2L by ASHRAE, with an extremely narrow flammability range (1.1% volume in air) which makes it much less flammable than other A2Ls

Most other options available, based on HFC/HFO mixtures, do not comply with these restrictions on use, since they have a GWP higher than 150. Moreover, the use of propane in such systems is difficult, due to the restricted charge and its high flammability (A3) - leading to extra costs in manufacture, transport, installation, servicing and disposal, and increased safety risks for end users and servicing companies. Even though multiple circuit solutions are available for propane units, this adds cost to system design, build and maintenance. By way of comparison, R-455A is classified as mildly flammable and this reduced risk enables an increased maximum charge size to be used, opening up opportunities for OEMs to enter higher capability markets.


Several large manufacturers of hermetically sealed compressors have already assessed the performance of R-455A over the last 18 months. During these tests they observed a capability and discharge temperature similar to those of R-404A but with greater efficiency. The technical properties of R-455A have also proven to be a good alternative to R-410A on rotary and scroll compressors, which operate at higher pressures and need a wider temperature operating range.

	Solstice® L40X (R-455A)
Fluid replaced	R-404A (A1, 3922 / 3943)
GWP 4 th / 5 th IPCC	148 / 146
Composition	21.5 / 75.5 / 3 (R-32 / R-1234yf / R-744)
Classification	A2L
Use	New installations
Drop-in ⁽¹⁾ capability	Similar
Drop-in ⁽¹⁾ Efficiency	+6 to +10%
Compressor ⁽²⁾	Piston, Rotary, Scroll
Comment	Same discharge temperature at freezing temperatures
Status	Marketed by Climalife


Although commercial refrigeration is the main target, it also has potential in a range of industrial segments. For example, R-455A has a lower discharge temperature than all other R-410A replacement products and reaches high condensing temperatures of 80°C without any liquid injection. This potentially opens the way to penetrating the heat pump market for specific uses such as the production of hot water. Honeywell believes that R-455A has the potential to replace not only R-22, R-407C, R-404A and R-290 but also R-410A and R-32 in the long term.

Frost-Trol strengthens its environmentally friendly position

One of the first companies to use R-455A is Frost-Trol, a Spanish company specialising in the design, manufacture and marketing of remote, self-contained refrigerated cabinets in the retail sector. Frost-Trol, known for implementing environmentally friendly solutions, tested R-455A in its Lomond LT island display cabinet with an Embraco VNEK217U compressor and Carel regulator. R-455A (230g charge) was in a unit adapted for propane and achieved a similar capability to R-404A but with higher efficiency ratings. With a GWP of 146* (more than 96% lower than R-404A) R-455A is subject to minimum quota (only the R32 part needs to be accounted for) and does not attract HFC taxes.



* IPCC 5.



+ More info on:
climalife.dehon.com/refrigerants

Dates for your diary!

United Kingdom

6 TO 8 JUNE 2017
AUTOMECHANIKA

Automechanika is the UK's leading international trade fair for the automotive service, supply chain and tyre industry. The Climalife team look forward to welcoming you to **stand 20E43 from 6 to 8 June** at the NEC in Birmingham.

Holland

28 TO 30 MARCH 2017
KLIMAATVAK

In light of regulatory and environmental changes, Climalife will take part in the 10th Klimaatvak trade show from **28 to 30 March** in Gorinchem, the Netherlands.

Spain

28 FEBRUARY TO 3 MARCH 2017
CLIMATIZACIÓN Y REFRIGERACIÓN

The international trade show dedicated to air conditioning, heating, ventilation, and industrial and commercial refrigeration will be held from **28 February to 3 March 2017** at Feria de Madrid. Join us at **stand D22 in Hall 8**, where Climalife will be very pleased to give you a preview of its latest new products:

- R-455A (Solstice® L40X), the new refrigerant with a GWP of 148 intended for on-board units, condensing units and hermetically sealed low-temperature systems.
- Environmentally-friendly heat transfer fluids. The complete Greenway® Neo range, covers a working range of -55°C to +200°C and reduces a unit's environmental impact.

To receive your entrance badge, contact :
climalife.es@climalife.dehon.com

Belgium

21 MARCH TO 23 MARCH 2017
REFRITEC-ON-TOUR

Climalife will partner Refritec-on-Tour, an annual networking event not to be missed in the HVACR sector, where information plays a vital role. Thanks to presentations from the markets biggest suppliers, Refritec-on-Tour invites installers, consultants and end users to the.

Three locations for your diary:

- 21 March in Grobbendonk (Anvers) - Flemish
- 22 March in Nazareth (Gand) - Flemish
- 23 March in Wavre (Bruxelles) - French.

Hungary

22 MARCH 2017
ANNUAL SYMPOSIUM

Climalife Hungary will hold its annual symposium on **22 March 2017** at Holiday Inn Budaörs.

On the agenda:

- EN378 flammability standard for new fluids
- Solutions to replace high-GWP fluids in commercial and industrial refrigeration (How to manage the implementation of fluids with a temperature glide)
- The advantages of indirect systems
- Air conditioning alternatives

The Climalife Hungary team looks forward to meeting you on this day, packed with technical information. **To register, contact your sales representative or send an E-mail to:**
climalife.hu@climalife.dehon.com

International - China

12 TO 14 APRIL 2017
CHINA REFRIGERATION

Galco will occupy a stand at the China Refrigeration trade show in Shanghai. This important international trade show, will open its doors to HVAC sector professionals from 12 to 14 April 2017. The Climalife Galco team will welcome you at **stand E3G07** and introduce you to the **new refrigerants** designed to face the future changes brought about by the **gradual and global reduction of HFCs** as well as modified lubricants.

International - France

9 TO 11 JUNE 2017
VOILES DU FROID



The next Voiles du Froid regatta will set sail from Saint Raphaël for île Sainte Marguerite in France on **9, 10 and 11 June 2017**.

A haven of peace, île Sainte Marguerite is the largest of the Lérins islands and faces the city of Cannes. Between turquoise coves and pine and eucalyptus forest, the setting could not be more idyllic. Embarking at Port de Santa Lucia, Saint Raphaël and sailing in this enchanting environment will be a great opportunity to compete in a regatta and admire this stretch of the Mediterranean coast, dominated by the red rocky headlands of the Esterel massif.

Take part in an international event that attracts refrigeration and air conditioning professionals from around the world who meet every year to share their passion for adventure, whet their cultural appetite and even break records. This event can be summed up in two words: sportsmanship and conviviality. Contact your Climalife sales representative **for a registration form** or download the form at www.voilesdufroid.com

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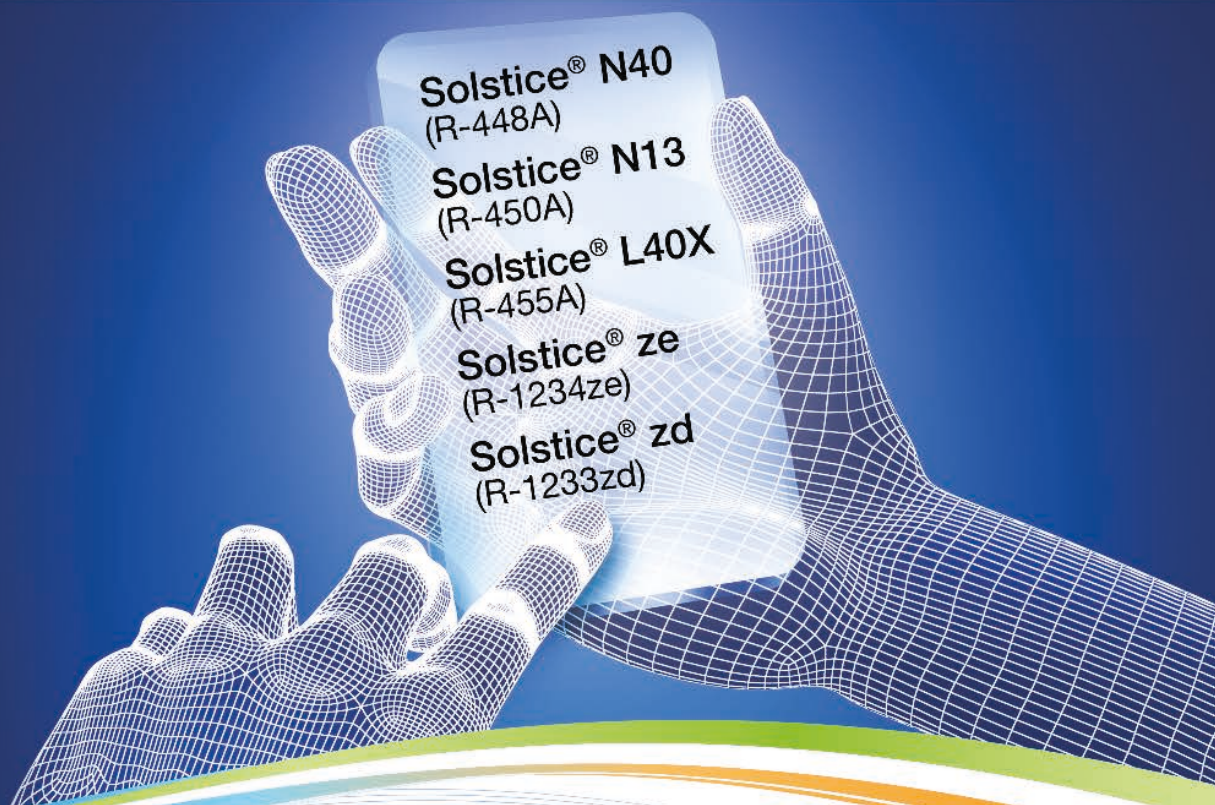
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Solstice® HFO range: a complete solution to face tomorrow's challenges



Solstice® product

Traditional refrigerant replacement

Applications

Benefit



Solstice® N40 (R-448A)
GWP* = 1387

R-404A



Medium and low temperature applications
Condensing units
Self contained unit
Refrigerated transport

- ODP = 0
- GWP is 65% lower than R-404A
- Reduced energy consumption by 5 to 16%
- Non-flammable (ASHRAE A1)



Solstice® L40X (R-455A)
GWP = 148

R-404A



Condensing units
Self contained units at low temperature
Hermetically Sealed Low Temperature Systems
Chillers, Heat Pumps

- ODP = 0
- GWP < 150 mildly flammable (ASHRAE A2L)
- Better efficiency
- Greater allowable charge than propane



Solstice® N13 (R-450A)
GWP = 605

R-134a



Medium temperature refrigeration
CO₂ cascade

- ODP = 0
- GWP is 58% lower than R-134a
- Non inflammable (ASHRAE A1)



Solstice® ze (R-1234ze)
GWP < 1

R-134a



Heat pumps
Medium and high pressure chillers
Refrigeration equipment

- ODP = 0
- GWP is 99.9% lower than R-134a
- Low flammability (ASHRAE A2L)



Solstice® zd (R-1233zd)
GWP = 1

R-123



Low pressure chillers
High temperature heat pumps

- ODP = 0
- Non-flammable (ASHRAE A1)

R-245fa

Organic Rankine cycle

*GWP values are those stated according to the 4th IPCC assessment as per F-Gas regulation except for Solstice® yf/ze (IPCC revision 5)

Honeywell | Refrigerants

climalife®

Climalife refrigerants:
solutions for today and tomorrow