

# n°7 Climalife Contact

October 2014

The European magazine for climate control system professionals

## Climalife F-Gas Approved Solutions



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Price: 2,50 €





PASCAL DEHON, MANAGING DIRECTOR

## Climalife F-Gas approved Solutions

The story of the Dehon Group is first and foremost a story of Cooling systems, currently represented by our Climalife entity. In the Group's 140<sup>th</sup> anniversary year, Climalife is continuing its transformation strategy and demonstrates the strength of its customer-orientated distribution model.

Our philosophy remains one of understanding your needs and developing new solutions. Our business and technological performance has seen growth through an optimisation strategy driven by the new F-Gas regulations which apply from the 1st January 2015 and in particular by the development of a new collaborative communication tool.

The Climalife mobile smartphone app tells the user in a few clicks what the new regulations are for the selected installation (Heat Pump, Air Conditioning, Commercial refrigeration system, etc.); whether new or existing, and allows them to select the most suitable refrigerant for the situation.

Depending on their overall performance, Climalife will also introduce new HFO molecules as they are developed along with other technologies as they are brought onto the market.

We are aware of the industry uncertainties that remain and we continue to grow our technical skills. We are determined to remain a loyal and reliable partner thanks to the confidence you have shown in us over many years, and for which we thank you.

Happy reading!

## Leak detection: F-Gas II uses Global Warming Potential to determine check frequency

**E**U Regulation No. 517/2014, or F-Gas II, was published in the official journal on 20 May 2014 and will take effect on 1 January 2015. With the new law, it is important to know the Global Warming Potential (GWP) of the refrigerant used in a given system.

The GWP value is a measure of the potential contribution to global warming made by a refrigerant released into the atmosphere over a given period of time. It is expressed as a factor of the warming effect caused by an identical amount of CO<sub>2</sub> over the same period.

The Intergovernmental Panel for Climate Control (IPCC) calculates GWP values, which take several factors into account.

F-Gas 842/2006 values were based on the third IPCC report, while F-Gas II values are based on the body's fourth report.

**One of the main changes that will affect equipment owners, service engineers and installation technicians, starting 1 January 2015, concerns leak detection.**

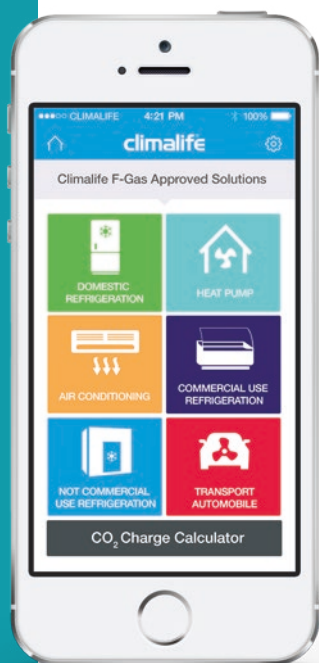
Current leak check guidelines are based on thresholds of 3, 30, and 300 kg of refrigerant, whereas F-Gas II establishes new CO<sub>2</sub>-equivalent thresholds: 5, 50, and 500 Tonnes of CO<sub>2</sub> equivalent (T CO<sub>2</sub>-eq).

To calculate T CO<sub>2</sub>-eq for a given system, you need to know the GWP for the refrigerant used. In order to help you meet the new regulatory requirements, Climalife has designed a mobile application that makes it easy for you to find out the refrigerant GWP and the T CO<sub>2</sub>-eq for the amount of refrigerant in your system.

The app thus lets you determine the frequency of leak checks required by the new regulation (see table).

System	Leak check frequency
containing $\geq 5$ and $< 50$ T CO <sub>2</sub> -eq of HFC	Every 12 months, or every 24 months if a leakage detection system features permanent detection devices able to alert operator
containing $\geq 50$ and $< 500$ T CO <sub>2</sub> -eq of HFC	Every 6 months, or every 12 months if a leakage detection system features permanent detection devices able to alert operator
refrigeration systems, air conditioning systems, heat pumps, and refrigerated trucks and trailers containing $\geq 500$ T CO <sub>2</sub> -eq of HFC	Every every 6 months, and system must have permanent detection devices able to alert operator or service company
using organic Rankine cycle or electrical switchgear which contain $\geq 500$ T CO <sub>2</sub> -eq of HFC	Every 3 months, or every 6 months if system features permanent detection devices able to alert operator or service company (mandatory for all systems installed after 1 January 2017)

NB: Hermetically sealed systems containing  $< 10$  T CO<sub>2</sub>-eq are exempt. Fire protection systems are also subject to periodic leak checks.



## Synthetic lubricants for refrigeration output in the future

*The importance of refrigeration to meet the global requirements of the food chain, health care sectors or even the automotive industry has never been so great. Environmental concerns, upheld in particular by the Montreal and Kyoto protocols, have led to a change of technology in terms of refrigerants for refrigeration output by compression, which has had an impact on the choice of lubricants.*



**Gilles Delafargue, an expert in customer technical support for Europe, Africa & the Middle East at ExxonMobil, explained to us how synthetic lubricants can respond to changes in refrigeration output by compression and improve the energy efficiency of installations.**

*Mr Delafargue, could you share with us your vision of the changes to the refrigerant market?*

**G.D. :** The Montreal Protocol (1989) has led to the gradual withdrawal of substances with a high Ozone Depletion Potential (ODP) and has had an impact on the use of ChloroFluoroCarbon type refrigerants (CFC- currently banned) and on that of HydroChloroFluoroCarbons (HCFC which are in the process of being withdrawn from use). The Kyoto protocol (1997) defined the targets for reducing greenhouse gases. These decisions have affected certain HydroFluoroCarbons (HFC) with a high Global Warming Potential (GWP) even though they do not attack the ozone layer, and have led to the development of HydroFluoroOlefins (HFO).

These changes to the legislation on environmental protection have indirectly brought about a return to the use of ammonia (NH<sub>3</sub>), carbon dioxide (CO<sub>2</sub>) and, to some extent, hydrocarbons (HC).

The use of HCs remains confined to small household appliances but the promoters of HC continue with their wish to develop their use in larger installations such as industrial ice production machines, freezers or even chillers. HFCs are still very much with us, although their replacement by HFO type fluids with low GWP is going to increase.

In Europe, we have seen the promotion of CO<sub>2</sub> and then HFO-1234yf in the area of automotive air conditioning.

*In the face of these changes, what criteria should be taken into account when choosing a lubricant?*

**G.D. :** Most of the industrial refrigeration installations are compression systems, in which cooling is produced by the evaporation of a refrigerant such as a HFC, HFO, HC, ammonia or CO<sub>2</sub>.

The nature of the refrigerant, the type of compressor and the temperature in the evaporator will determine the type of lubricant as well as its viscosity. In this respect, the miscibility and solubility of the refrigerant / lubricant mixture are key parameters to be considered.

Appropriate lubricant / refrigerant miscibility at the temperature of the evaporator is crucial for so-called "miscible" applications (systems without an oil separator). The refrigerant / oil mixture must remain homogeneous until the end of evaporation so that it can return to the compressor. If there is separation of the 2 components due to poor miscibility, the oil will be trapped in the evaporator, significantly deteriorating the efficiency of the refrigeration installation and / or affecting the correct operation of the compressor (low oil level).

In the compressor, the high pressure and the high temperature will contribute to reducing the viscosity of the lubricant (linked to the solubility of the refrigerant in the oil). Viscosity that is too low will affect the protection against wear.

The harmful effects of the reduction in viscosity can be avoided by selecting the appropriate type of oil and viscosity for the application. ExxonMobil has established a large number of miscibility curves and "VPT" (Viscosity / Pressure / Temperature) curves in order to ensure that the selected lubricant corresponds to the miscibility and viscosity requirements of the application. Customers also benefit from technical support thanks to experts in the field or via the ExxonMobil European Technical Support Centre.

*Which lubricants have you developed for use in refrigeration installations?*

**G.D. :** ExxonMobil rigorously monitors changes to legislation and has been able to meet the environmental protection requirements by marketing high performance lubricants for applications with ammonia, HFOs or CO<sub>2</sub>. The Mobil EAL Arctic ("Environmental Awareness Lubricant") synthetic lubricants have been specially developed for lubricating compressors and systems using HFC refrigerants. They are formulated from oils with a Polyolester (POE) type base and have notable properties in terms of lubrication, protection against wear and per-



fect chemical stability and remarkable resistance to thermal stress. Mobil EAL Arctic lubricants have miscibility compatible with HFCs and well defined Viscosity / Pressure / Temperature characteristics with a large number of HFC fluids. Large scale installations, using ammonia (which is not very or not at all miscible with hydrocarbon lubricants) as the refrigerant, are fitted with oil separators.

Thus, it is important to use a lubricant that is completely non-miscible with the refrigerant and with a low vapour pressure in order to avoid or minimise any oil being dragged into the circuit. Mobil Gargoyl Arctic SHC 200 oils, which are formulated from oils with a PolyAlphaOlefin (PAO) type base, are recommended for lubricating refrigeration compressors operating at very high temperatures and low temperatures in the evaporator.

Their solubility and miscibility with refrigerants is low and the result is the formation of thick films of oil in the presence of refrigerants under pressure, making it possible to minimise oil leaks in the compressor shaft seals. Their high level of resistance to shearing, their high viscosity level and their excellent fluidity at low temperature allow Mobil Gargoyl Arctic SHC 200 oils to guarantee high level performances for the harshest applications with ammonia.

Mobil Gargoyl Arctic SHC 200 oils can also be used to lubricate CO<sub>2</sub> installations that are not or not very miscible. In addition, Mobil Gargoyl Arctic SHC 200 oils are NSF H1 registered and can therefore be used for incidental food contact applications.

Can the choice of lubricant have an impact on the energy efficiency of the installation?

**G.D. :** Numerous refrigeration installations now use ammonia as a refrigerant. The main lubricant technologies for ammonia-based applications are:

- Naphthenic Mineral (NM) and Paraffinic Mineral (PM) oil, refined from crude oil with Naphthenic or Paraffinic tendency.

- Synthetic oils formulated from PolyAlphaOlefin (PAO) bases or from mixtures with a PAO / AB (AlkylBenzene) base.

A detailed study conducted in 2011 at the EMRE (ExxonMobil Research & Engineering) Research Centre in the USA, showed that PAO technology-based synthetic lubricants were potentially the best technical choice for ammonia-based applications compared to MN and MP technologies (major possibility of improving the efficiency of the installation, better characteristics at low temperatures, better control of movement of oil, excellent control of viscosity at high temperatures, better degassing characteristics).

Mobil Gargoyl Arctic SHC 200 oils, with PAO technology and paraffin-free, demonstrated remarkable performances in non-miscible applications for compressors for industrial use, in supermarkets or for heat pumps and specifically in ammonia-based applications. In addition, the study also showed that the low temperature viscosity of the PAO technology-based ExxonMobil oils is a lot lower than that of Naphtenic or Paraffinic Mineral technology-based oils.

This makes it possible to considerably improve the installation by minimising the thickness of the insulating layer generated by the oil trapped in the evaporator and altering the efficiency of thermal exchanges.

The results also confirmed that Mobil Gargoyl Arctic SHC 200 oils have excellent resistance to thermal stress and oxidation and excellent chemical stability thus allowing a potential increase in the period of use of the lubricant, extension of the drainage intervals, increase in the period of use of the filters and a reduction in the number of leaks from the compressor shaft seal.

By way of example, the use of Mobil Gargoyl Arctic SHC 226E allowed a major brewery in Poland to save €100,200 in 3 years. After the changeover to the synthetic lubricant (instead of the mineral oil that was being used), the intervals between drainage were multiplied by 6 (in other words, drainage every three years instead of two

drainages per year) leading to a reduction in the costs of draining and maintaining the oil separator and the costs associated with processing the used oil. Furthermore, the compressor maintenance costs were reduced through excellent control of cleanliness.

In your opinion, what will the refrigeration output model be for the future?

Alternative technologies for refrigeration output, such as "Magnetic Refrigeration" are starting to appear on the market. "Magnetic Refrigeration" (energy saving process) generates refrigeration by changing the temperature of certain alloys when they are submitted to a magnetic field ("Magnetocaloric" effect) without the need to use expensive compressors or refrigerants. Two European companies recently announced their plans to launch, within two years from now, "magnetic refrigeration" technology systems for domestic installations.

Nonetheless, traditional compression systems, accompanied by a changeover to low GWP refrigerants, will remain on the market.

To conclude, what would be your final recommendation?

**G.D. :** The running of an industrial refrigeration installation goes hand in hand with appropriate maintenance. Breakdowns or reductions in capacity of the installations can lead to significant losses of production or stored products. With the use of refrigerants such as ammonia, CO<sub>2</sub> and HCs and the gradual replacement of HFCs with low-GWP HFO type fluids, the availability of high quality lubricants that meet environmental requirements becomes essential.

ExxonMobil has been able to respond to these changes by developing and offering a range of products available worldwide in order to meet tomorrow's challenges, while continuing to supply recommendations and provide technical support for its customers.

**GILLES DELAFARGUE, EXXONMOBIL**  
Expert in customer technical support



## COMMERCIAL COOLING

# Precision embrace new low GWP solutions & offer R-1234ze in all new refrigerator models

*Established in 2008, Precision Refrigeration is a leading manufacturer of professional refrigeration products in the UK, committed to protecting the environment and continually seeking solutions to improve the energy efficiency of their products.*

Their British built refrigeration products are installed in a variety of foodservice establishments including restaurants, hotels, bars, fast food chains and production kitchens, meeting the needs of customers all around the world.

Lead by Managing Director Nick Williams, the team at Precision pride themselves as having one of the lowest carbon footprints in the industry and continually seek to use new low GWP (Global Warming Potential) solutions for their customers without the flammability of hydrocarbons.

## A partnership committed to quality

Climalife have worked with Precision since 2011, and introduced the new Honeywell HFOs and HFO blends that are being brought to market. During the ACR show in 2012 an introduction was made to Honeywell, and Precision conducted some trials on various low GWP options with a view to bringing new products to market as soon as possible.

## Foodservice refrigerants of the future – now available on all Precision refrigerator models

This year, Precision have been making big step changes within their sector, continuing to demonstrate their commitment to offering products that protect the environment. Following extensive tests, Precision have become the first to offer the very low GWP refrigerant R-1234ze as an option across its refrigerated storage range, from under counter cabinets to blast chillers.

R-1234ze is a one of a new generation of HFOs available with a GWP of only 7\* and is now being offered by Precision instead of R-134a which has a GWP of 1430. The performance of R-1234ze has been shown to be comparable with R-134a in their equipment and is non-flammable at temperatures below 30°C.



By moving quickly to very low GWP options and maintaining an energy efficient product, Precision is able to meet all future environmental requirements with a refrigerant with a GWP below 150.

Nick Williams says "We've been trialling Solstice® ze manufactured by Honeywell for around two years. It performs as well as, if not better than, traditional refrigerants like R-134a and hydrocarbon R-290 in our equipment. With some minor modifications we have made, the Solstice® ze cabinet is more efficient than R-134a. It runs particularly well in high ambient conditions, which is ideal for the foodservice industry."

"HFOs like Solstice® ze are more environmentally friendly than traditional refrigerants such as R-134a and safer than hydrocarbons: they are the foodservice refrigerants of the future."

Peter Dinnage, Technical Director of Climalife UK comments "although R-1234ze theoretically has a lower capacity than R-134a, minor modifications can be made that recover any loss in new equipment".

## Freezer counter trial

In 2012, Precision Refrigeration, in collaboration with Climalife in the UK and Honeywell staged a test comparing R-404A - the refrigerant of choice for freezer applications, against low GWP blend alternative N40. The objective was to evaluate the temperature performance and energy consumption of a standard Precision LCU323 three door freezer counter cabinet.

Temperature performance and energy consumption was tested to EN153 over a 24 hour period with the cabinet empty of product and the door closed. The tests focused on four areas; (1) Pull-down time: the quicker the time, the greater the energy saved (lower running costs); (2) Recovery time after defrost: similar benefits to pull-down time; (3) Maximum Discharge temperature: impacts on life of compressor and whole-life performance of equipment – the most critical test from Precision's perspective; (4) Energy consumption: measured in kWh over 24 hours.

The results of this test demonstrated that the Honeywell product Solstice® N40 was found to exceed the refrigeration performance of R-404A, whilst at the same time, exhibiting lower recovery time and improved pull-down time. Not to forget its lower GWP value of 1387, around a 65% reduction on R-404A. N40 provides a non-flammable solution, with faster pull down time than R-404A, however, is only currently available in test quantities.

As soon as it does become commercially available Precision Refrigeration plan to offer N40 (R-448A) to their customers in all new equipment as soon as it is commercially available.

**Company:** Precision Refrigeration.  
**Business:** Professional refrigeration for food service industry.  
**Location:** Thetford, Norfolk, UK.  
**Date of creation:** 2008.  
**Employees:** 45.  
**Turnover:** £5 million.

\*GWP Values IPCC 4<sup>th</sup> Assessment. 5<sup>th</sup> Assessment value for R1234ze = <1, for R448A (N40) = 1273.  
Photos © Kristen McCluskie, [www.kristenmccluskie.com](http://www.kristenmccluskie.com)

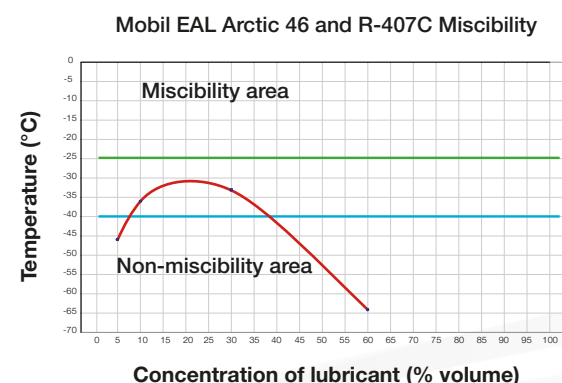
## Use of a miscibility curve

The red curve defines the areas of solubility between Mobil EAL Arctic 46 and the R-407C fluid form just one phase whatever the concentration of Mobil EAL Arctic 46. At -40°C (blue line): A single phase for concentrations of Mobil EAL 46 of less than 7.5% 2 non-miscible phases for concentrations of Mobil EAL Arctic 46 of between 7.5 and 38%, a single phase above 38% Mobil EAL Arctic 46.

Above this curve, the lubricant and refrigerant form just one phase.

## Digital application:

For a temperature of -25°C (green line), Mobil EAL Arctic 46 and the R-407C fluid form just one phase whatever the concentration of Mobil EAL Arctic 46. At -40°C (blue line): A single phase for concentrations of Mobil EAL 46 of less than 7.5% 2 non-miscible phases for concentrations of Mobil EAL Arctic 46 of between 7.5 and 38%, a single phase above 38% Mobil EAL Arctic 46.



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# Innovative Refrigeration System, Combining the 'Best of Both Worlds'

*"Our aim was to successfully trial the new HFO Blend N13 in a Flagship store and to prove it's operational and energy saving credentials. The results speak for themselves"*

JEAN-MICHEL DEROO, AUCHAN GROUP

## Creating a More Sustainable Approach to Refrigeration

When it comes to delivering on environmental promises, Groupe Auchan has an enviable record, having been rated among the greenest supermarket chains and openly publishing its ambitious annual carbon reduction targets.

Part of this eco-commitment involves finding greener ways of operating its stores – and this includes refrigeration – so when the company heard about the benefits of a new Honeywell HFO blend – Solstice® N13 (R-450A) – they were keen to test its credentials. Solstice® N13, recently awarded official ASHRAE classification as R-450A, is an alternative to R-134a, offering similar performance but with a superior GWP of ~600 and is ideally suited to chillers and MT refrigeration (distributed, CO<sub>2</sub> cascade), offering the best non-flammable replacement for R-134a.

Approval was given to design a combined Solstice® N13/CO<sub>2</sub> refrigeration system for a new large hypermarket opening in Epinay-sur-Seine (Paris), with measurement criteria focused on energy efficiency, equivalent CO<sub>2</sub> emissions reduction and refrigeration performance.

The test utilised a new design of low energy refrigeration unit and involved a team from Auchan, the company's refrigeration partners Axima Refrigeration and Honeywell.

The test focused on assessing the merits of a system that incorporated an N13 liquefaction unit alongside a CO<sub>2</sub> refrigerated distribution circuit. The system was then compared with Auchan's current standard set-up that uses R134a and glycol water with CO<sub>2</sub>.

## The results to date have been encouraging, and include:

- Easy commissioning, with similar energy efficiency as R-134a.

- A global saving of 90 tons CO<sub>2</sub>eq/year compared with a secondary Glycol/R 134A/CO<sub>2</sub> system and savings of 960 tons CO<sub>2</sub>eq/year compared with using a standard R404A DX system.

## Background: Contributing to Groupe Auchan's Environmental Goals

Groupe Auchan is at the leading edge of mitigating the ecological footprint generated by its different activities and constantly strives to innovate in order to lower energy consumption, contribute to the fight against global warming and promote biodiversity.

All of the group's businesses control their energy consumption by setting ambitious annual reduction targets. The installation of smart meters helps the chain to identify waste and to optimize consumption.

To help meet the European Union's objective of 20% of all energy usage coming from renewable energy by 2020, Auchan has invested in solar and geothermal energy over recent years.

All new buildings include autonomous energy production systems and, as a result, more than 55% of energy consumed by Auchan comes from renewable sources.

The refrigeration pilot project at Epinay-sur-Seine is, therefore, entirely in keeping with the context of building a greener operating environment.

## Field Test Implementation: Monitoring and Assessing Data

Groupe Auchan worked alongside its refrigeration partner Axima Refrigeration to develop a system for the Epinay-sur-Seine store that



combined the low GWP and energy efficiency benefits of a new refrigeration HFO blend named Solstice® N13 (R-450A) – and the proven performance of pumped CO<sub>2</sub>.

The system uses Solstice® N13 in a liquefaction unit to convert gaseous CO<sub>2</sub> into a liquid that is then pumped to deep freeze containers, cold rooms and display cabinets. The CO<sub>2</sub> returns in a gaseous form to the Solstice® N13 liquefaction unit ready for converting again to liquid.

To support the yearly energy saving objectives of the project, the system includes a floating high pressure, a floating low pressure, as well as variable speed control on the compressors of the negative CO<sub>2</sub> rig, on the positive N13 compressor and on heat recovery units.

## COMMERCIAL COOLING



### Field Test Results :

#### Proving the Value of Solstice® N13 (R-450A)

Since the opening of the Auchan Epinay store in October 2013, a thorough evaluation of the results by the entire project team confirmed the energy efficiency benefits of the trial.

### ENERGY CONSUMPTION

▶ The Solstice® N13/ CO<sub>2</sub> system is on par with energy consumption of the standard Groupe Auchan R-134a/ CO<sub>2</sub> system.

The new system was also measured against the following criteria to ensure the **resulting performance was as good if not better than the current design.**

▶ **Discharge temperature at compressor head** 110 °C (Below that of R-134a systems).

▶ **Compressor Oil temperature** 55°C (Below that of R-134a systems).

## Feedback: A Greener Outcome for Group Auchan

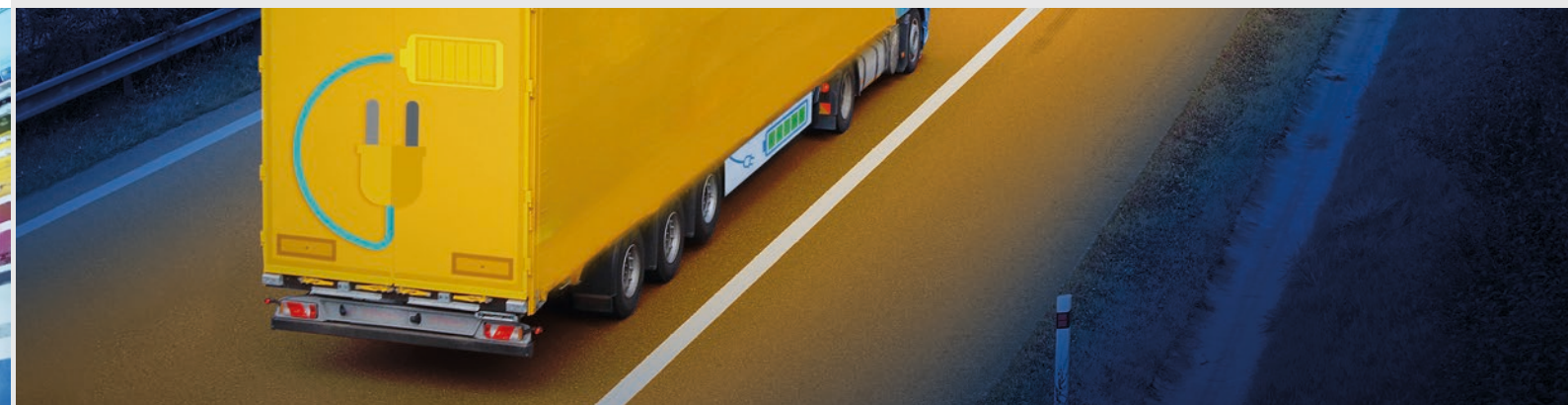
"Groupe Auchan places environmental responsibility at the top of its business agenda and we are very supportive of innovations such as this new approach to refrigeration that delivers benefits to us as a business, to the customers we serve and to the wider community".

JEAN-MICHEL DEROO,  
GROUP AUCHAN

"We are continuously looking to apply more sustainable and lower GWP solutions into Supermarkets such as Auchan. With the experience and results of this Solstice® N13 trial, we are now confident we can deliver even greater environmental benefits to the industry. The choice of refrigerant is a fundamental element in our strategy for the reduction of CO<sub>2</sub> equivalent emissions and for maintaining or improving energy efficiency".

## REFRIGERATED TRANSPORT

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



Heller AG, located in St-Margrethen (Switzerland), has 10 employees and specialises in energy management systems for heat pumps, commercial and industrial cooling installations and refrigerated transport.

The company currently has refrigerated trucks including the Electro Truck which it hires to customers such as Frisco-Findus, Migros, Stadler Rail, and South-East railways.

Designed by Renault, the Electro Truck has an all-up weight of 13 tonnes and operates entirely by electricity. Its large batteries are accommodated within the chassis. Given this new set-up, Heller revised the design of the refrigeration system it normally uses in order to reduce its size to fit into this new truck. A reduced-size

Heller Eutekt 4 ESE unit with a 14 kg load of Performax® LT (R-407F) and fitted with a Copeland Scroll ZF13 KV E-TFD-551 compressor with enhanced vapour injection (EVI) was designed and installed. This compressor was chosen as it improves the COP by up to 27% according to standard EN12900 and has reduced electrical consumption relative to standard compressors.

The energy required to maintain cooling is stored electrically in the batteries overnight. The accumulated cooling power is sufficient for a full day of deliveries of daily orders to small supermarkets, restaurants, etc. at the rate of 5 customers per hour with the doors being opened for a period of about three minutes each. The installer chose R-407F refrigerant distributed

by Climalife for the ElectroTruck given its GWP and energy efficiency. Before being used in this new system, Heller had previously carried out a comparison with R-404A on a trailer and a refrigerated lorry when this fluid was launched. After what was a conclusive experiment, R-407F with low GWP was deemed essential for this electric lorry and has enabled Heller to take a big step forward in its environmental and refrigerated transport modernisation programme in Switzerland.

This project has demonstrated how good a replacement R-407F is for the R-404A refrigerant used previously. Currently, 2 Electro Trucks are operating perfectly with Performax® LT, one around Zurich and the other around Lausanne. No problems have been reported.

ter environmental benefits to the industry. The choice of refrigerant is a fundamental element in our strategy for the reduction of CO<sub>2</sub> equivalent emissions and for maintaining or improving energy efficiency".

CÉDRIC LEROY,  
AXIMA REFRIGERATION

## Sector Perspective: Rolling Out the Benefits of Solstice® N13

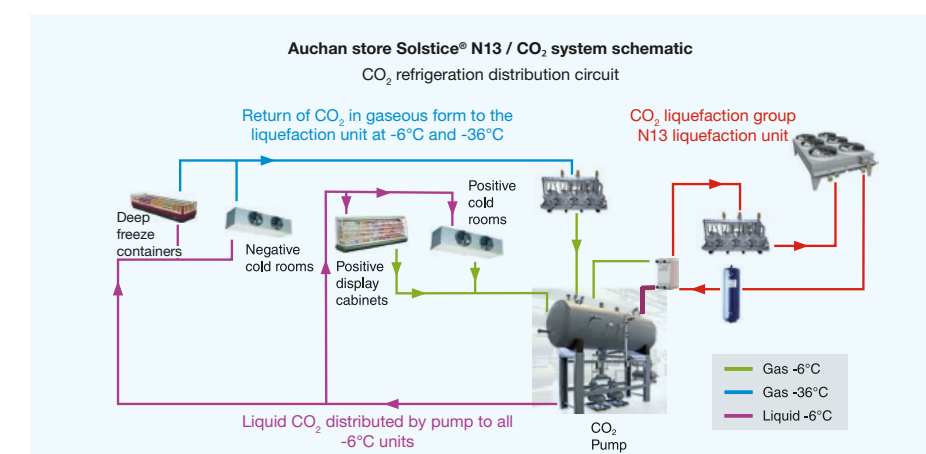
The Field Test with Groupe Auchan confirms the energy efficiency benefits of using Solstice® N13 (R-450A) alongside CO<sub>2</sub> in a cascade system, with additional advantages in terms of CO<sub>2</sub> equivalent emissions reduction and much lower GWP (-58%) over traditional refrigerants such as R-134a.

For more information about N13, do not hesitate to contact your Climalife sales representative.

### System Details:

#### Primary Refrigeration

- Refrigerant: Solstice® N13 (R-450A)
- Refrigerant charge: 1,200 kg's
- Refrigeration power: 800 kW
- Consumption power: 350 kW



- Regime (evap. / condensing temp): -11 °C / +45°C
- Comp. type and manufacturer: Screw / Bitzer
- No. of compressors: 6 Comps (3 per pack)
- Pack Brand / Number: SCM Frigo / 2 Packs

### MT Refrigeration

- Pumped Secondary Fluid: CO<sub>2</sub>
- Secondary Fluid Charge: 2,000 kg's

### LT Refrigeration

- Refrigerant: CO<sub>2</sub>
- Refrigerant Charge: 2,000 kg's
- Refrigeration power: 105 kW
- Absorption power: 21kW
- Regime (evap. / condensing temp): -45°C / +35°C
- Comp. type and manufacturer: S/Hermetic Recip/ Bitzer
- Number of compressors: 3 Comps
- N° of chambers and packs: 1 pack







# Follow the Greenway® Neo: A renewed and complete range of plant-based secondary refrigerant / heat transfer fluids

Climalife, a leading specialist in the formulation of heat transfer fluids for more than 30 years, **is strongly committed to solutions from plant resources.**

**Greenway® Neo : a technological and environmentally friendly alternative!**

The Climalife R&D department has developed and patented this new formula **Greenway® Neo** for use across a range of applications including refrigeration, air conditioning, heat pumps, central heating, thermal solar energy and sprinklers. Climalife's objective is to offer a reliable and effective technical alternative to traditional based fluids. The **Greenway® Neo** secondary refrigerants / heat transfer fluids are formulated based on 1,3-Propanediol (Bio-PDO™), the raw material used and produced by fermentation of natural 99.7% purified glucose syrup, and long-lasting organic corrosion inhibitors. The **Greenway® Neo** formula continues to be borax-free in compliance with European Directive 2005/58/EC dated 15/09/2008. In compliance with the ISO 11930 international standard, **Greenway® Neo** is bacteriostatic\*. This anti-microbial protection prevents bacteria proliferation in thermal facilities. The new range of **Greenway® Neo** is approved on the A list from the French General Health Department for heat treatment by simple water exchange intended for human consumption as defined by ANSES and also approved by Belgaqua, the Belgian Professional Federation for the water sector, according to the standard NBN-EN 1717 as a fluid category 3.



## Greenway® Neo: a global offer for thermal system professionals!

### ► Greenway® Neo:

concentrated heat transfer fluid for refrigeration, air conditioning, and fire extinguishing system circuits, as well as under-floor heating/cooling circuits.

**Advantage:** a lower viscosity than that of Mono-Propylene Glycol which is traditionally used for this type of application.

### ► Greenway® Neo Solar -25°C:

ready-to-use heat transfer fluid particularly suitable for sanitary hot water production in solar thermal systems for medium temperature panels and high temperature vacuum tubes.

**Advantage:** a low degradability in a circuit slows its ageing, provides protection against periods of stagnation, avoids "tarring" of collectors and systems, and gives installations a longer working life.

### ► Greenway® Neo Heat Pump -25 °C:

ready-to-use heat transfer fluid particularly suitable for geothermal ground source and aerothermal Air/Water heat pump systems.

**Advantage:** a reduced risk of polluting the ground in the event of a system leak.

.....  
Contact your Climalife sales representative for more information on the Greenway® Neo range of dilutions available.

\*Tests performed using a minimum concentration of 30% volume.

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leum-free, sustainable and renewable resource. The unique thermal stability of Susterra® offers differentiated protection from acid buildup at high temperatures seen in applications such as solar thermal. A decrease in acid buildup results in a more efficient system with a longer lifespan, which means a better return on a customer's investment in equipment. Susterra® offers excellent freeze protection and has better viscosity than propylene glycol at low temperatures, so it can help increase the efficiency of pumping equipment. Susterra® 1,3 propanediol is also readily biodegradable, making it a good choice for customers looking for a safe glycol with low toxicity. It is less irritating to the skin than propylene glycol, and is safe for incidental food contact.

Now, materials like Susterra® 1,3 propanediol can be derived from renewable sources, making the promise of carbon neutrality and

independence from petroleum a possibility. Susterra® is certified 100% biobased by the U.S. Department of Agriculture, making it attractive for business owners seeking renewable content in their products.

A peer reviewed life cycle assessment (LCA) demonstrates that the production of biobased propanediol offers significant environmental benefits including up to 40 percent less greenhouse gas emissions and 40 percent less non-renewable energy used in production versus petroleum-based glycols.

At DuPont Tate & Lyle Bio Products, we believe products such as Susterra® can offer our customers differentiated performance while still protecting the environment and reducing the world's dependence on petroleum

**Visit** [www.duponttateandlyle.com](http://www.duponttateandlyle.com) for more information.

# Dates for your diary!

## France

### Symposium AFCE

On 23 October 2014, with the support of IFFI, the 13th symposium AFCE will be held at the Conservatory of "Arts and métiers" in Paris. This event will consist of 2 elements: an explanation of F-Gas II in the morning and a presentation of some alternatives to high-GWP refrigerants in the afternoon. A round table discussion on the alternatives will close the conference.



**Find the program and register at:**  
[www.afce.asso.fr](http://www.afce.asso.fr)

## Hungary

The Hungarian Association of refrigeration and air conditioning will hold its annual conference on 19 to 21 November 2014 in the Velence Hotel Resort & Spa. Climalife will have a stand and run some technical presentations.

## International



**The Galco Climalife team** will welcome you to the AHR EXPO in Chicago from 26 to 28 January 2015 at stand No. 4878.



## Europe

### Voiles du Froid 2014: the 22nd sunny sailing event around Izenah

On 23rd May, 19 single-hull vessels set sail for the Ile aux Moines to discover the dream panorama which opens up over the Gulf of Morbihan.

Organised by Climalife and its valued partners, Assurfroid, Clima+comfort, Eurovent Certification Company, GEA Heat Exchangers, Exxon Mobil, Honeywell, HRS, ITE, RPF and Snefcca, this 22nd event was held in a warm and competitive atmosphere.



From Friday afternoon the tone was set. 160 refrigeration and air conditioning professionals raced in waters where the strong currents and counter currents do not allow the slightest mistake.

The ITE boat took the lead in the rankings after the two first races sponsored by GEA and Mobil Lubricants, closely followed by the GEA 2 and IDS Froid boats.

When they arrived on the Ile aux Moines, known as Izenah in the Breton language, the participants jumped on their bikes heading for the protected Trec'h headland where a fabulous evening showcasing local specialties took place.

Each of the sailors brought culinary delights from across the different countries of Europe that awakened everybody's taste buds, amidst the sound of jazzy tunes.

With the weather just as good on Saturday; the sun and wind both present, the boats sailing under colourful spinnakers on this «little sea» dotted with numerous islands were a magnificent sight.

The previous winners confirmed their position in the Honeywell and HRS races which saw new challengers appear for second and third place. Everyone got in the saddle for the "Stones on the Land" historical and cultural treasure hunt. This gave participants the opportunity to travel all over the Ile aux Moines from top to bottom and in particular to discover the Kergonan stone circle at the end of the day.

The two final legs sponsored by Snefcca and Climalife were the deciding factor between the competitors.



The Voiles du Froid trophy was won by the ITE boat from Belgium, and left France once again for the second consecutive year. A cocktail party was organised at Port du Crouesty to close the event and wish everyone a warm goodbye.

**See pictures of the Voiles du Froid 2014**  
[www.climalife.dehon.com](http://www.climalife.dehon.com)

## DuPont Tate & Lyle Susterra®

renewably sourced™ propanediol

The new range of **Greenway® Neo** is the result of a technical collaboration between Climalife and Dupont Tate & Lyle, manufacturer of the raw material Bio-PDO™ (Susterra®). The contribution by DuPont Tate & Lyle of the technical characteristics of this new plant-based raw material has allowed Climalife to add its expertise to its application and to develop a specific formula that meets the needs of each business sector. (refrigeration, air conditioning, heating, renewable energy).

DuPont Tate & Lyle Bio Products is proud to offer Susterra® 1,3-propanediol to the market because our company's mission is to provide customers a competitive advantage by offering a glycol with superior performance from a petro-

### • The subsidiaries:

- France: dehon service SA (Management and Services)  
[climlife.fr@climlife.dehon.com](mailto:climlife.fr@climlife.dehon.com)
- Belgium/Luxembourg: dehon service belgium  
[climlife.be@climlife.dehon.com](mailto:climlife.be@climlife.dehon.com)
- Netherlands: dehon service nederland  
[climlife.nl@climlife.dehon.com](mailto:climlife.nl@climlife.dehon.com)
- Germany: dcf - [climlife.de@climlife.dehon.com](mailto:climlife.de@climlife.dehon.com)
- Hungary: Climalife kft - [climlife.hu@climlife.dehon.com](mailto:climlife.hu@climlife.dehon.com)
- Spain: friogas - [climlife.es@climlife.dehon.com](mailto:climlife.es@climlife.dehon.com)
- United Kingdom: IDS Refrigeration Ltd  
[climlife.uk@climlife.dehon.com](mailto:climlife.uk@climlife.dehon.com)
- Switzerland: prochimac  
[climlife.ch@climlife.dehon.com](mailto:climlife.ch@climlife.dehon.com)

- Italy: Inventec Performance Chemicals Italia S.r.l.  
[climlife.it@climlife.dehon.com](mailto:climlife.it@climlife.dehon.com)
- Scandinavia: dehon nordic service  
[climlife.se@climlife.dehon.com](mailto:climlife.se@climlife.dehon.com)
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# Follow the **Greenway® Neo**, the technological and environmentally friendly alternative



Food processing  
Warehousing  
Supermarkets

Residential buildings  
Government buildings  
Airports  
Train stations

Approved by:

- ANSES
- Belgaqua

## **Greenway® Neo: The plant-based secondary refrigerant for refrigeration and air conditioning**

- Improves system performance and increases its lifetime
- The only secondary refrigerant approved for temperatures as low as -50°C with a lower viscosity than MPG
- Reduced environmental footprint, ideal for ISO 14000 / ISO 2200 certified companies

**climalife®**  
[www.climalife.dehon.com](http://www.climalife.dehon.com)