

n°8 Climalife Contact

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The European magazine for climate control system professionals

Innovating together
for responsible **energy**
efficiency!



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Price: 2,50 €



CHRISTOPHE MOROTE, ACTIVITY DIRECTOR
CLIMALIFE

Innovating together for responsible energy efficiency!

We are all aware that reducing energy consumption is not enough: it is necessary to consume energy more responsibly too.

Nowadays, we have a number of energy resources; some of which offer real opportunities for responsible consumption. The development of solar, geothermal and wind power illustrate this.

Thermodynamics may also contribute to a significant reduction in consumption. Energy efficiency is therefore one of the major concerns which must be taken into account during the design or conversion of thermal installations.

It is on this complementary aspect that Climalife is concentrating its R&D efforts to offer you innovative and sustainable solutions. The vegetable-based Greenway® Neo heat transfer fluid, which is formulated according to the specific requirements of certain applications, is a good example of this.

Responsible innovation is also about surrounding oneself with the best players in the market in order to offer you the latest technologies, such as low-GWP molecules as well as new generation lubricants, the vectors of energy saving.

Climalife's investment for innovation represents a significant percentage of turnover. With a multi-disciplinary development and application team, we commit ourselves to this path on a daily basis.

Innovating is a state of mind - it does not invent itself!

Happy reading!

Fluorinated greenhouse gas-based solvents

Fluorinated greenhouse gas-based solvents, like refrigerants, are regulated by the EU Regulation 517/2014, also known as F-Gas II, which came into effect on 1 January 2015.

For refrigeration and air-conditioning equipment, solvents are primarily used for internal cleaning of systems.

As with refrigerants, the personnel working with these solvents require a certification of competency.

This certificate is different from and complementary to that issued to refrigeration technicians for handling refrigerants.

Furthermore, the recovery of fluorinated greenhouse gas-based solvents is obligatory and must be performed by certified personnel. The process for issuing this certificate is described in more detail in the regulation 206/2008 EC.

Although the specifics of the placing on the market of fluorinated greenhouse gas-based solvents are set out in F-Gas II, each Member State may impose further obligations. France, for one, has done just that (see box opposite).

In response to these regulations, Climalife has developed and formulated a new internal cleaning product without fluorinated greenhouse gases, Nettogaz GC+ (for more information, see page 14).

LAURENT GUÉGAN
REGULATORY AFFAIRS MANAGER CLIMALIFE

Focus on France:

Since the inclusion of the Decree of 13 April 2011 in the French Environmental Code, the supply of greenhouse gas-based solvents, against payment or free of charge, requires the Buyer to have certified personnel (Art. R521-57) and imposes the same constraints as for fluorinated refrigerants such as record keeping (Art. R521-58) and the annual declaration to the French Environment and Energy Management Agency (ADEME) (Art. R521-66).

Those who recover the fluorinated greenhouse gas-based solvents provide the French Environment and Energy Management Agency with an annual declaration of the fluorinated greenhouse gases they have recovered for treatment and the quantities released into the atmosphere.

This declaration specifies the identity, name or company name and address of the operators of the destruction, recycling and reclamation facilities to which the gas has been delivered, the address of the facilities, if different, and the quantities of each type of gas delivered to each facility.

www.syderep.ademe.fr



The impact of the implementation of quotas on the refrigeration and air conditioning market

The new F-Gas II regulation introduces a completely new mechanism aimed at gradually reducing HFCs until 2030 to reduce emissions of fluorinated greenhouse gases.

This gradual reduction, called "phasedown" has an important impact on the thermodynamic industry, which must quickly adapt the way it uses fluorinated gases.



Alain Lelièvre-Damit, Refrigerant purchasing manager and Climalife activity coordinator for Europe explains in practical terms the issues raised by regulation 517/2014 CE on the quantities of refrigerant placed on the market.

Mr Lelièvre-Damit, could you explain to us briefly what a quota is according to the F-Gas II regulation?

A.L.D.: A quota is the overall quantity of HFC refrigerants, expressed in equivalent tonnes of CO₂, that producers and importers can place on the market. At the end of 2014, the European Commission allocated each producer or importer an annual marketing quota that decreases over the years leading up to 2030.

What basis did the European Commission use for allocating the quotas?

A.L.D.: The quota allocation is based on the average quantity of all types of HFC expressed in equivalent tonnes of CO₂ put on the European Union market from 2009 to 2012. This is calculated on the basis of data declared by HFC producers and importers (in compliance with article 6 of the previous F-Gas 842/2006 regulation), which was compiled by the European Environment Agency.

In practical terms, this equates to about 180 million equivalent tonnes of CO₂. Given that the average GWP of a fluid regardless of application is 2000, this is equivalent to a volume of 90,000 tonnes.

On the ground, will professionals using refrigerants have the same quantity of HFC fluids available in the future?

A.L.D.: It is important to understand that the aim of this legislation is to reduce the impact of global warming. By using this new CO₂-tonne equivalent mechanism (i.e. the charge in kg of a fluid multiplied by its GWP), it is clear that producers and importers will need to make choices on the quantities of products they put on the market in the years to come. So if a producer-importer puts 100 kg of R-404A with a GWP of 3922 on the market, they will consume 392.2 CO₂ equivalent tonnes of their quota. If they market a fluid with a lower GWP such as R-448A with a GWP of 1387, they will only consume 138.7 CO₂ equivalent tonnes of CO₂.

Taking into account the large phase down step in 2018, i.e. 37% reduction in HFCs on the market in CO₂ eq. T, we will expect to see a significant reduction in the availability of products with high GWP such as R-404A, R-507A, etc.

The availability of these fluids will become more restricted over the next three years, and well before the cut-off date of 2020.

Will the implementation of quotas only impact the availability of fluids or will it have other consequences as well?

A.L.D.: It seems clear to me that between the quotas allocated and the CO₂ eq. T mechanism, a product which consumes more CO₂ equivalent tonnes will be less available in the future as

100 kg of R-404A
(GWP = 3922)



100 kg of R-448A
(GWP = 1387)



I have just emphasised. And as we all know, a rarer product always costs more than a standard one. We are already seeing announcements of price increases from the fluorinated product producers on the European market.

What strategy must be put in place to make existing installations using HFCs sustainable over the long term?

A.L.D.: There are replacement solutions for high GWP fluids currently on the market which have already been proven over a number of years. Performax® LT (R-407F), a substitute for R-404A, is a good example. Climalife, always at the forefront, was one of the first companies to position itself on Performax® LT which has

the market and meet the prohibition criteria of F-Gas II. In addition, these new solutions have the advantage of being more energy-efficient, an important criterion to be taken into account by installers.

Our recommendation is to anticipate the changeover from high-GWP fluids in existing installations from now on and apply a simple rule: only convert installations which are in good condition and whose performance is satisfactory.

The first objective is to prolong the life of the installation whilst keeping as many as possible or all its constituent components to reduce

most suited to their requirements and specific applications.

What do you recommend for new installations in the future?

A.L.D.: Nowadays, different types of molecule are available on the market. Non-flammable, low-flammability or high-flammability products, fluorinated or non-fluorinated, non-toxic or highly-toxic, products operating at low pressure or high pressure, there is no standard molecule for covering all refrigeration and air conditioning applications.

The same applies when installing a new thermal installation, the choice of fluid must be studied

Any change is a source of opportunity and innovation for all players in the industry. The thermodynamic industry needs to adapt as a consequence, and act quickly. We cannot wait until the crucial date of 2020, that will be too late!

To conclude, what means have you put in place as a leading refrigerant distributor in Europe to support your customers in facing up to this change?

A.L.D.: Since 2010, we have deployed additional resources to anticipate this change to the regulations. We have introduced refrigerants with lower GWPs onto the market such as Performax® LT, Solstice® ze and R-448A and have built up in parallel our global range of solutions with regard

to secondary refrigerants/heat transfer fluids, refrigeration oils and leak detection equipment to cope with this change.

Moreover we actively participate in the various professional events organised in Europe to inform installers and end-users of new products in the pipeline and share our technical expertise with them.

We organise our own technical conference days in partnership with our suppliers to explain, in practical terms to our customers, the implementation of these new solutions in line with their requirements.

We also provide a modelling service to compare the various solutions in new or existing installations.

To provide day-to-day support for refrigeration, air conditioning, heating and NRE professionals, Climalife has developed an "F-Gas Solutions" smartphone app. Simple, informative and free, this application removes the complexity from the "F-Gas II" regulations and provides an accurate answer in a few clicks.

ALAIN LELIÈVRE DAMIT, REFRIGERANT PURCHASING MANAGER - CLIMALIFE ACTIVITY COORDINATOR FOR EUROPE



made itself the premier lower-GWP alternative to R-404A.

This refrigerant is already widely used in both commercial and non-commercial refrigeration installations. Its GWP of 1825 is already more than 50% less than that of R-404A which is 3922. Feedback has been good. This product is easy to use in a conversion and requires little investment.

In parallel, new lower-GWP HFO/HFC molecules have been developed by producers to anticipate these regulations and to meet the requirements of the industry. These are also now available on

the economic and environmental impact of the operation, limit investments and ensure the depreciation of recent installations.

The solution must enable thermodynamic performance to be obtained which is compatible with the requirements. A diagnosis and feasibility assessment should be drawn up before undertaking a conversion to other HFC-based blends.

Climalife is positioning itself to help its customers test these new molecules in their systems and share its technical expertise to support them in choosing the fluid for their systems which is the

by taking into account a number of technical, economic and environmental parameters depending on the application in question.

Several criteria may be used to determine the most suitable fluid, in particular:

- GWP of the fluid,
- operating conditions,
- energy efficiency,
- implementation of the chosen fluid,
- safety,
- return on investment.

This new phase down mechanism will instigate considerable changes for the thermodynamic industry as you have just explained. How do you see this transition in the years to come?

A.L.D.: This is not the first schism the cooling market has faced. When it started in 1830, particularly dangerous, difficult to control and inefficient products were used (NH₃, SO₂, CCl₄, H₂O, etc.) the main purpose of which was to preserve foodstuffs. Then successive waves of legislation hit the market and it was necessary to find viable and easily applicable technical solutions to make the systems sustainable over the long term.

We have lived through the replacement of CFCs by HCFCs, then HCFCs by HFCs and now it is the turn of HFCs to be replaced by HFOs and other technologies.

MOBILE APPLICATION

F-Gas Solutions: the mobile application for everyone is enriched with a new tool!

Following on from its success, Climalife has responded to requests by F-Gas Solutions users and integrated a new "Leak Detection Frequency" module.

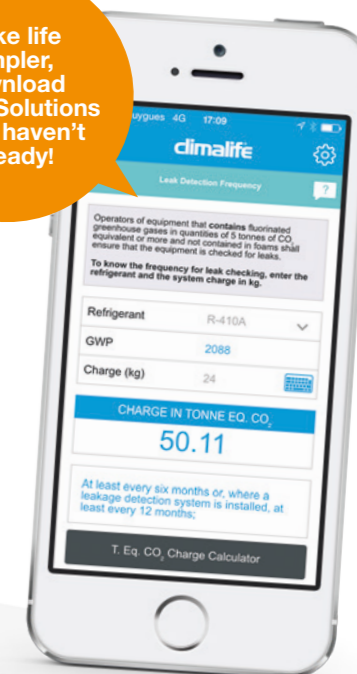
More than 7000 professionals have downloaded this mobile app to cope with the challenges of European regulation no. 517/2014 known as F-gas II which was applicable from 1 January 2015. Available in 7 languages (French, English, German, Dutch, Italian, Spanish, Hungarian), F-Gas Solutions has recently been updated and now includes replacement solutions for R-22 in existing installations, the most recent fluids to appear on the market and a new module to find out the leak detection frequency for an installation.

To use this feature, just enter the refrigerant used in the installation and its charge and one click tells you the frequency with which leak checks must be carried out.

It is an essential everyday tool which tells you:

- the refrigerants available on the market depending on your application (air conditioning, heat pump, commercial cooling, etc.) and the type of equipment,
- the dates at which certain refrigerants will be prohibited in the various applications,
- the value in CO₂ equivalent tonnes for the refrigerants in your systems,
- the correct GWP value for the refrigerants you use,
- the leak detection frequency for your installations.

Make life simpler, download F-Gas Solutions if you haven't already!



How to get the app?

- Go to the App Store or Google Play and search for: "F-Gas Solutions."
- When this logo appears, start the download.
- Downloading the application and using it are **FREE**.



REFRIGERANTS AVAILABLE ON THE MARKET

Refrigerant	Safety and other concerns
HFO	Non-toxic, non or mildly flammable. Potential to be a direct replacement in some systems. Very Low GWP values.
HFC / HFO blends	Non-toxic, non or mildly flammable. Higher but F-Gas compliant GWP values.
Ammonia	Toxic and mildly flammable. Mainly limited to Indirect systems or direct systems in unoccupied spaces. Requires specialist design work.
Hydrocarbons (R-600a, R-290, R-1270, etc)	Non-toxic, highly flammable. System construction changes needed. Charge size limitations. For new systems only.
CO ₂	Non-toxic, non-flammable. High operating pressures. For new Systems only.

A Cool Solution for an Eco-Friendly Bakery

The first-ever Solstice® ze/CO₂ industrial cascade system for food processing.

Summary: Where traditional craft meets innovation

The Maurer Bakery is a family bakery and retail business preparing bread and other products that are chilled or frozen for onward distribution to the company's network of 42 bakery-café outlets in Germany.

In all, Maurer employs 400 people, 70 of whom work in the company's two production facilities. Maurer is proud of its traditional approach to bread-making ("einfach, gutes Brot") and operates during the night in order to deliver products to stores that open every morning at 6am.

The newest factory, which extended the production area from 2,500 to a total of 6,000 square metres, includes a very large preparation area, 25 cold rooms and 4 freezer rooms, all cooled via a cascade system, which has been designed for a life-cycle of at least 20 years.

The design had to take account of the requirements of F-GAS Regulations and, as a consequence, the company looked to its refrigeration partner, Ice COOL, who in collaboration with ECR and Climalife Holland could define the low GWP solution.

Honeywell's Solstice® ze (HFO-1234ze), with a GWP <1 according the IPCC 5th review, was matched with CO₂ to create the first such industrial cascade system. It is also the perfect fit for Maurer's commitment to energy efficiency and low environmental impact.

Background: Rising to the challenge

Central to the decision of Maurer about the refrigeration system was the ability not only to meet incoming regulations but to implement a strategy that would bear down on energy consumption and enable the company to meet its stated environmental aims.

The design of the refrigeration system was key in the development of the new production

facility at the bakery. Maurer worked closely with Ice COOL, which specialises in customised solutions for the development of hygienic, eco-friendly and energy-efficient refrigeration for bakeries.

They spent 6 months working through the challenge of designing a cascade system that could operate efficiently and accommodate the different pressure profiles of the refrigerants, collaborating closely with ECR.

ECR-Nederland BV has a strong reputation for customised solutions, notably by applying very powerful 3D design modelling wrapped inside a full project package, compliant with PED and other regulations, and this approach was harnessed to ensure that Maurer was able to evaluate system performance and approve the overall design.

The Solstice® ze option was introduced to ECR by Climalife Holland who had previously participated in a number of field trials involving Solstice® ze and highlighted the innovation as a future-proofed, lowest possible GWP solution.

One major benefit is that Solstice® ze is not considered a fluorinated greenhouse gas and thus is not included in the quota allocations that will restrict placing HFCs on the market after 2015.

The system design was optimised to the lower pressure of Solstice® ze versus the traditional refrigerant R-134a. As Solstice® ze is mildly flammable, Ice Cool checked with a certified body about ATEX compliance, who assessed that given the very low risk of Solstice® ze in that system design, ATEX extra measures were not needed.

Project Implementation: Installing an industry 'first'

Maurer commissioned the chiller/freezer system in November 2013 following extensive evaluation of Solstice® ze undertaken by Climalife and ECR as part of the Ice COOL design.

The result is the first industrial cascade installation that combines Solstice® ze for medium temperature control and CO₂ for low temperature.

The cascade configuration has also enabled Maurer to meet its commitment to low energy consumption and reduced environmental impact. Indeed, as part of the system set-up, total energy performance is now closely monitored.

REFRIGERATION



"After one year of operation, the installation is working safely as expected and helping us achieve our environmental targets, as well as delivering a long term solution that will meet refrigerant regulatory requirements in the future without any additional investment in system renovation."

TOBIAS MAURER, GENERAL MANAGER



RESULTS

► The partnership successfully delivered and implemented the first-ever Solstice® ze/CO₂ industrial cascade system for chilling and freezing.

► The refrigeration performance is very satisfactory at all different temperatures required for the production and offices, which guarantees the high quality required for this business.

► As well as reducing the direct emissions by 99.9% and indirect by the improved CoP, the installation provides a future-proof solution with high safety standards.

From a technical perspective, bringing Solstice® ze and CO₂ together in a single configuration presented challenges because CO₂ is a high capacity, very fast fluid, whereas Solstice® ze is slow to reach steady stage because of its lower capacity.

It took this combined expertise to deliver a solution that not only meets the needs of Maurer but also has great potential across the food industry.

In this system, Solstice® ze is used for direct expansion on the high side down to evaporating temperatures of -10°C and -15°C, feeding the cold rooms as well as the working area where

REFRIGERATION

"We have tested Solstice® ze and confirmed that it has a better CoP. When taking account of the total cost of ownership and failure/safety issues, we believe that Solstice® ze is a perfect solution for installations such as this."

UDO J. VAN DER MEER, ECR-NETHERLANDS BV



products are prepared. CO₂ is used on the low side for the freezer rooms and the blast freezing process needed for some special dough products. Electronic expansion valves are used on both the MT and LT operations.

The circuits also include two Güntner Microx condensers (tube volume of 2x20L) with EC-Fans, one Alfa Laval heat exchanger for heat recovery of 300 kW and one dry cooler for CO₂ discharge gas cooling.

Sector Perspective: Delivering a low GWP solution

Maurer's adoption of Honeywell Solstice® ze reflects growing demand in the Food & Beverage market for the application of refrigerants with low GWP, energy efficiency and reduced carbon emissions.

The refrigerant is an alternative to R-134a, with a GWP of <1 and ideally suited to chillers, vending, CO₂ cascade systems, air dryers and heat pumps.

"Using our long experience of working with HFCs, ammonia R-290 and CO₂, we have tested Solstice® ze and confirmed that it has a better CoP. When taking account of the total cost of ownership and failure/safety issues, we believe that Solstice® ze is a perfect solution for installations such as this. We are currently considering Solstice® ze as an option for supermarket high side refrigeration combined with CO₂ on the low side."

UDO J. VAN DER MEER, ECR-NETHERLANDS BV

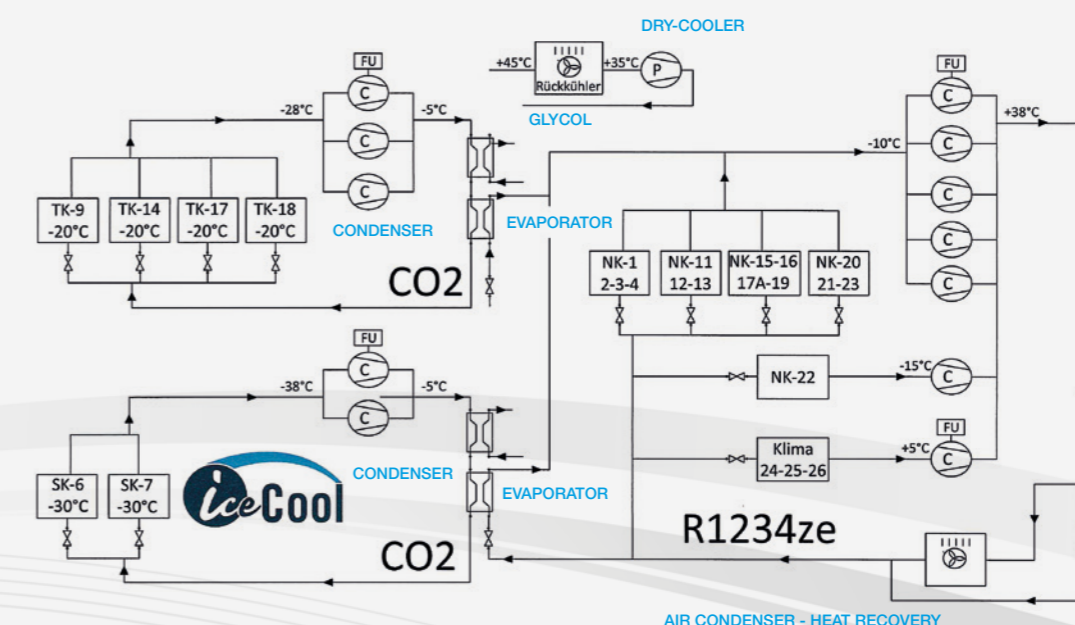
"We had to go through a learning curve to optimise the entire installation performance, as Solstice® ze and CO₂ are not the easiest combination due to their very different capacities and speeds to reach steady stage. But now we are satisfied and positive that a cascade system combining Solstice® ze with CO₂ is a sound, reliable and efficient choice when the design and safety conditions are properly handled."

PETER WEHRENS, ICE COOL

SYSTEM INFORMATION

MT Refrigeration	
Refrigerant	HFO-1234ze
Refrigerant charge	300 kg
Refrigeration power	245 kW
Cold rooms and cascade	5 x Bitzer piston compressors 206 kW @ -10°C Tevap 1 x Bitzer piston compressor 15 kW @ -15°C Tevap
Working area for food preparation	1 x Bitzer piston compressor 24 kW ~ +5°C Tevap

LT Refrigeration	
Refrigerant	CO ₂
Refrigerant charge	150 kg
Refrigeration power	135 kW
Stroke freezing rooms	2 x Bitzer piston compressors 70 kW @ -38°C Tevap
Static freezing	3 x Bitzer piston compressors 65 kW @ -25°C Tevap



FOOD CULTIVATION COOLING

Greenway® Neo heat transfer fluid: the ecological choice

FCV has developed a complex and consistent installation for an organic endive production facility Désir Nature SARL.

Specialising in industrial refrigeration and the food cultivation industry since its creation in 1997, FCV works principally to support the endive production market (80%), but also works with potato and fruit producers in northern France. In addition, FCV is recognised in the market for its vacuum cooling cells.

Pascal Hollocou trained as an engineer and was a director at Alcatel Lucent before he launched his new venture by purchasing FCV in 2010, with the aim of being his own boss and exploring a new profession: refrigeration. The company is now a successful operation, with 9 employees and a turnover of 1.85 million euros.

The cultivation of endives (also known as chicory or chicon) is a labour-intensive process. The endive does not exist in a natural state. It is the result of a forcing process developed around the middle of the 19th century. To produce the white leaves, the plants need to be grown in total darkness. Endive production takes place in 5 stages (see the summary opposite) and requires specific expertise from both the producer and the refrigeration specialist.

Désir Nature SARL has opted for an ecological process

Henri Trévaux, an affiliate member of the Lefebvre family operation based in Peronne, branched out into organic cultivation five years ago. The time was right for such a change and the endive producer also now has the facility to source organically grown root crops locally.

In 2014, the production of "Désir nature" organic endives required the construction of a new endive cultivation facility to meet the organic farming criteria for AB accreditation. Henri Trévaux collaborated with FCV to design the industrial refrigeration processes required for endive cultivation. "Refrigeration is crucial, particularly for conserving endives in cold rooms and growing them in forcing rooms", Pascal Hollocou reminds us.

Company: FCV SARL

Business: Industrial and agri-food refrigeration, Air conditioning

Specialisation: Vacuum cooling cells

Location: Vaulx Vraucourt (62), France

Date created: 1997 (bought out in 2010)

Employees: 9

Turnover: €1.85 million



Industrial process specifications

Once they have been harvested from the fields, the endives need to be stored on pallets in cold rooms, in order to preserve their roots. The aim is to cool the heart of the endives to around 0°C as quickly as possible from the moment they are introduced, and to ensure air circulation between each pallet to avoid them drying out. Then, as required, the endives are removed and placed in the development room.

The endive grows to maturity over three weeks - this is the forcing process. The ambient temperature needs to be between 12°C and 22°C, depending on the stage of development. The room also needs an irrigation system for the forcing trays, allowing water to reach each stack of crates at a temperature of between 8°C and 18°C. It should also be noted that this living product gives off heat.

FCV chooses Greenway® Neo

FCV's process is to guide their customers, where possible, towards a glycolated water system, in order to minimise the quantity of refrigerant in the installation, in line with evolving regulations.

Pascal Hollocou discovered Greenway® Neo at technical meetings organised by Climalife in northern France, and offered his customer



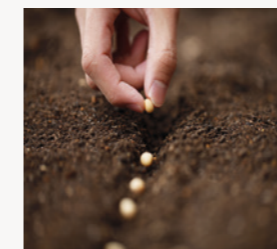
From left to right: Michel Pralon, Key Accounts manager Climalife; Hollocou Pascal, Head of FCV and Henri Trévaux, Co-leader of Désir Nature.

this vegetable based secondary refrigerant, manufactured from 1-3 propanediol rather than traditional fluids derived from petroleum, to remain faithful to his ecological process.



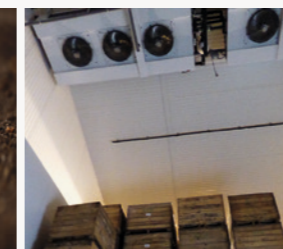
Endive cultivation, a specialised technology

In order to retain its whiteness, the endive needs to be grown in the dark, in a warm and humid atmosphere. **The 5 stages of endive production are:**



1. Seeding

To begin with, the seeds are sown in the fields in May. After 5 or 6 months, the endive roots develop in the ground, filling themselves with nutritious elements. They are then uprooted and harvested in November.



2. Conservation of endive roots

In order to spread production over time, roots are placed into large wooden crates then kept in a cold room for a period of between 8 days and 8 months.



3. Growing the endives

For the root to produce the endive, it is placed in damp, dark and warm conditions, in a facility known as the **forcing room**. The roots release their nutrients, allowing the endive to grow over a period of 21 days.



4. Breaking

Once the endive reaches maturity, it is separated from the root (broken).



5. Peeling and processing

The endives are peeled, sorted and packaged in sachets or cardboard boxes.

Company: Désir Nature SARL

Business: Organic endive production

Location: Peronne (80) - France

Employees: 11

Turnover: €850,000

Surface area of facility: 25,000 m²

Investment: : Over €1M

Production: 400 t of organic endives per year.

Production organisation: Primacoop

Sales office: Santerleg

"The decision was taken immediately," Henri Trévaux points out. "Although it wasn't stipulated in the "Agriculture Biologique" label specifications, in terms of organic image, it was important."

Proven experience for a complex and consistent installation

To meet the specifications and remain within the budget, FCV used its accumulated experience in the field to install all of the refrigeration, ventilation and irrigation equipment. FCV equipped the cold room with an MTA Aries Tech chilled water system with a cooling capacity of 116 kW.

Recycled heat from this externally located group is used to produce hot water to defrost the double-flux Profroid Duo 60 evaporators.

For the forcing room, FCV was required to heat

and cool water and air. Another MTA chilled water system with a cooling capacity of 93 kW was installed. For the heat, an MTA Hocean geothermal heat pump drawing on groundwater with a heating capacity of 86 kW was installed. This heat pump heats a facility with a surface area of 25,000 m².

The volume of Greenway® Neo secondary refrigerant used is 1,600 Litres for all the circuits. Each item of equipment, where possible, is fitted with frequency converters in order to optimise the installation's energy efficiency.

"Frequency converters are rarely used in the agricultural industry", the refrigeration technician reminds us. "This is an innovation that allows us to reduce operating costs, which are crucial in endive production facilities such as these."





SOLAR INSTALLATION

SolRnett brings solar system back to life

"...we found that SolRnett had completely neutralised the degraded glycol, it wasn't even sticky to touch!"

MATT YOUNG, TECHNICAL MANAGER AT GRIFFITHS AIR CONDITIONING

Background: Griffiths Air Conditioning has been in business since 1999 focusing on Air Conditioning and heat pumps. In more recent years they have specialised in the renewables market, installing Solar panels (PV and Thermal) and ground source heat pumps etc.

The customer: Sir Robert McAlpine, an existing commercial customer for air conditioning, spoke to one of the Griffiths engineers about a Solar Thermal system on a private house which had been experiencing some problems. Griffiths were asked to have a look at the problem.

The system: Upon investigation the engineer found that there had been degradation to the fluid originally used in the system (MPG based), which appeared like a sticky tar like residue. This type of problem can sometimes occur when a building is left empty and the system continues to receive energy from the sun. With no outlet for the heat, the system shuts the pump down and slowly heat builds up in the fluid to a point where it degrades.

In this particular system it was later found that the purge pump used on installing this equipment had been insufficient and the fluid had stagnated due to air pockets. This had caused the pump to be ineffective. Until recently the only solution to systems with this type of problem has been to completely replace the panels and other system parts – a costly exercise.

Company: Griffiths Air Conditioning
Activity: Air conditioning, installation of heat pumps and solar systems.
Location: Kettering, UK
Date of creation: 1999

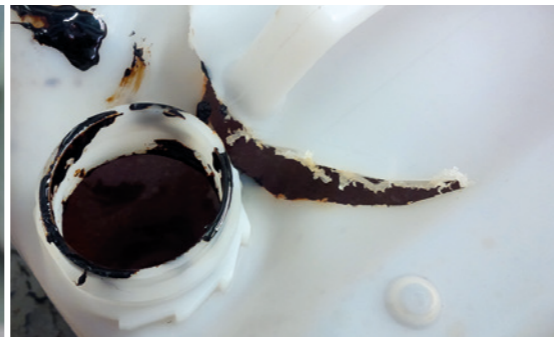


The solution: Griffiths Air Conditioning used the SolRnett product from Climalife: 'We had been pointed in the direction of SolRnett a while ago, by Climalife. We have confidence in them to know that SolRnett would be a viable solution to this problem', Matt Young, Technical Manager at Griffiths Air Conditioning.

The product had a dramatic effect cleaning the system, enabling them to re-charge with fresh fluid using a suitable purge pump to ensure that no air locks were contained in the system.

Matt Young explained: 'SolRnett was very easy to use, we first flushed with water, which came back clear, not moving any of the residue, we then followed the SolRnett product data sheet and as soon as it was added to the water the solution turned black, so we knew it was working really well. We left the solution circulating for approximately 1 hour and when the system was drained we found that SolRnett had completely neutralised the degraded glycol, it wasn't even sticky to touch!'

SolRnett has been formulated by Climalife to clean Solar Thermal systems where the fluid used has degraded or caramelised. It can remove tarry deposits and return a system to use, quickly and very cost effectively. The product is readily available from Climalife.



Conclusion: *"We would definitely use SolRnett again in similar circumstances. We would also use the Greenway Fluid as it can operate to higher temperatures, with less likelihood of degradation on this scale, it wasn't used on this occasion as the end user had already purchased other product."*

Dave Richards at Climalife UK commented: "Solar Thermal systems are becoming increasingly popular but can sometimes suffer from blockages caused by the premature degradation of a heat transfer fluid."

This case study demonstrates the excellent performance capability of Climalife's SolRnett cleaner that can create a sound basis on which to load the system with a good quality heat transfer fluid."



TERTIARY AIR CONDITIONING

Nettogaz GC+, tested in the field!

The new Climalife product Nettogaz GC+ has been tested and approved during the internal cleaning of air handling units in a strategic data centre in the Paris region.

The company Segotec, based in Vernouillet (78), mainly provides maintenance services in the tertiary sector.

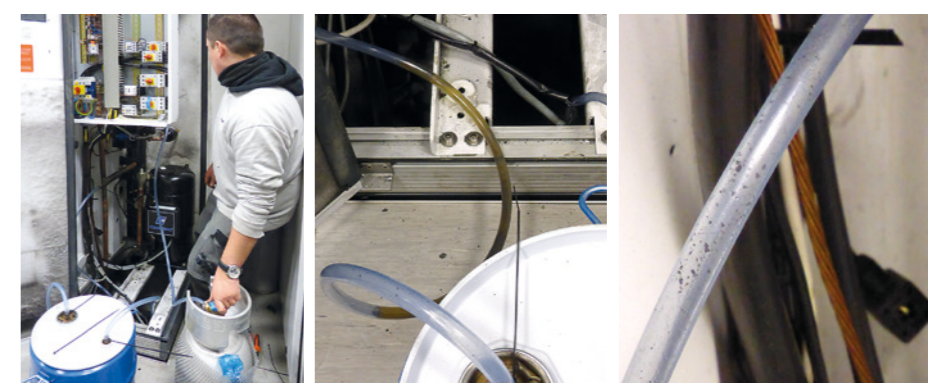
As it is responsible for the daily surveillance of a data centre for one of the main internet service providers in France, Segotec cannot afford to make mistakes in its operations. The site is visited every day to check the ongoing maintenance operations.

Created before the internet boom, this data centre is located in the Paris region and hosts storage systems and telecommunications equipment. "It's one of the operator's nerve centres, where the most important challenges are managing air conditioning and electrical consumption" explains Mr Vincent, the Works Manager at Segotec.

On the site, there are no fewer than 50 direct expansion air handling units which regulate the temperature of the data rooms specifically. Other technical installations and offices are also cooled through different means (Rooftop, VRV, etc.).

During maintenance, parts have been successfully replaced, but the refrigeration circuits have started to deteriorate. This has been evidenced by the presence of acidity in certain installations which is not caused by damage to the compressor. An audit was therefore performed by Segotec at the customer's request and a programme of rejuvenation and renovation of the refrigeration circuits set out, in view of the importance of these systems. "Making these installations more sustainable by reducing cumbersome maintenance procedures in the future was the challenge we were looking to meet", says Mr Vincent.

Company: SEGOTEC
Activity: Tertiary and Industrial Refrigeration and Air Conditioning
Location: Vernouillet (78) - France
Date of creation: 1999
Number of employees: 47
Sales revenue: €5.5 million



Approach to renovating the circuits

10 refrigeration circuits were to be renovated. As the units are duplicated, the air-conditioned area was not jeopardised. At most two circuits could be shut down at the same time, provided they were not too close together and the area did not overheat.

In order to comply with European regulations on fluorinated greenhouse gas-based solvents, Climalife developed and formulated a new product, Nettogaz GC+, and asked Segotec if it could be tested on site.

Testing and use of Nettogaz GC+

On 30 March, one of the two circuits in the air handling unit was shut down. After draining the circuit and recovering the refrigerant R-407C, the refrigerated circuit was divided into three parts, the evaporator, the condenser and the connection pipes.

Nettogaz GC+ was tested on the 50 kW STULZ evaporator, in accordance with the procedure supplied by Climalife. The GC+ circulation was activated by pulsations obtained by quickly alternating opening and shutting the valve of the cylinder so as to create a "water hammer" effect on the fluid.

Very quickly, thanks to the clear flexible PVC tube which joins the evaporator to the GC+ recovery barrel, the flow of GC+ could be observed, first black then more yellowish.

The oxide deposits could be seen clearly with the naked eye on the tube wall. The Nettogaz was circulated until it flowed out of the circuit clear. The cleaning took around 30 minutes and produced good results.

High-performance efficiency

The Segotec technicians were surprised but completely satisfied with the results. "It is clearly more effective and faster than the previous product or other products on the market" one of them said. This result is due to its linear cleaning capacity and its Kauri Butanol value of over 80, which proves its high performance in eliminating impurities from circuits.

"Moreover, the new GC+ packaging in this Friocatch bottle, equipped with a nitrogen connector, is better suited to our requirements" said a technician.

Nettogaz GC+ conforms to the field expectations and Segotec is proud to have been one of the first users. *"We always like to be involved in this kind of field test because things have to move forward, ..., it's always great to see suppliers who take an interest in the installers on site. The technicians are always happy to have the chance to participate and talk to you about their job. It opens their profession to the outside, which they appreciate"* concluded Mr Vincent.

Climalife R&D Department: anticipating and formulating solutions for tomorrow's requirements

The R&D department at Climalife is far from being an isolated entity. It is a dynamic department interacting with its customers, partners and the environment.

"Le petit Larousse" defines

innovation

as "The set of processes which takes place from the birth of an idea to its materialisation (product launch), going through the market study phase, development of the prototype and the first production steps."

An innovation ecosystem, the R&D department never ceases developing and changing in order to put forward innovative and sustainable solutions for refrigeration, air conditioning, heating and renewable energy professionals.

But also to go further than the usual technical characteristics by developing a range of products with superior performance (eg Greenway® Neo Solar, which benefits from less deterioration at high temperatures, Green Ice® with its lower freezing point and better viscosity)" explains our R&D Manager.

Remain flexible: the formulation of Greenway® Neo was not content with its traditional range of secondary refrigerants/heat transfer fluids. Indeed, from the start, Green Ice® was already cooling bottles of champagne.

Developed according to a very precise specification in collaboration with our customer Champagel, Green Ice® is used in the bottle neck freezing process.

Green Ice® has enabled a specialist in the freezing of sparkling wine bottle necks to provide a better response to the technical and economic requirements of champagne wine producers. More economical, more efficient and with a reduced environmental impact, Green Ice® is proof of the flexibility of Climalife's R&D department and the success of a collaboration between all the stakeholders.

- Customer requirements
- Regulatory change
- New technologies

Basic research

Production run and customer delivery

Application research

Field tests (real situations)

Standardised tests

Creation of production process

R&D Climalife: knowledge and expertise at your service

Remember that Climalife's R&D department above all else consists of women and men who have acquired knowledge in performance chemistry and have developed know-how. Our expertise comes from their knowledge, creativity, mastery and their practical experience as well as our multidisciplinary activities within the Group.

As changes have taken place, we have implemented R&D hubs in our various sites depending on specific technical requirements along with analysis and inspection laboratories both for incoming products and internally-formulated products. From Bry/Marne to Bergen Op Zoom, Budapest to Shanghai, the R&D department is now available to you on an international scale.

Our laboratories are ready to receive your samples for deep analysis based on multiple criteria. Conducting thousands of analyses every year has shaped our expertise in all types of refrigerants, heat transfer fluids, and oils.

For your regulatory, technical, exploratory, maintenance, or even routine analyses, you will receive guidance from our engineers in how to best use the results you get.

Our sole objective is to make all our assets available to you!

1- Innovate: monitor and interact within a given environment

The innovation ecosystem comprises not only interactions with customers and partners, but also a specific environment which changes and which is regulated. As such, Climalife takes advantage of the structure of the Dehon Group and its various cross-functional departments, for example HSE, Laboratory and Technical support to carry out continuous technological and regulatory observation.

To avoid stagnation and the risk of being overtaken, it is necessary to remain informed at all times, observe innovations which appear in the refrigeration, air conditioning and heating sector, and to ensure compliance with laws and regulations which emerge or change.

Membership and participation in associations and organisations such as EPEE, PERIFEM, AFCE and UBF that influence tomorrow's changes, enable us to maintain our innovative course.

As Gérard Abidh, Climalife R&D's manager emphasised. "Once this step has been completed upstream, it is essential to move on to applied research."

2- Innovation in synergy: basic research and applicative research

Innovation in synergy, for Climalife, involves using the basic research of the producers and developing an applicative research programme. This enables us to create new bespoke formulae dedicated to specific areas of our business.

We develop targeted partnerships with professionals, especially producers, manufacturers/constructors, industrial companies and distributors.

For example, through this synergy, the Greenway® Neo formula was created. Using the technical characteristics of a new raw material, Bio-PDO™ (by DuPont Tate & Lyle), allowed Climalife to formulate a vegetable-based heat transfer fluid. This formula is made up of 1-3 propanediol from the fermentation of natural glucose syrup purified to 99.7%, and long-duration organic corrosion inhibitors.

3- Innovating for and with the customer

To innovate means to be creative and find solutions which improve or even revolutionise our operations, but also to prove the ability to listen and be flexible.

In a rapidly and profoundly changing world, the DEHON group, faithful to its values, anticipates changes and remains at its customers' side to help them with the challenges inherent to the changes in their businesses.

In 2013, the Climalife R&D department patented Greenway® Neo and used its application expertise to develop products specific to refrigeration, air conditioning and renewable energy.

"Climalife had two objectives: we wanted first of all to offer technological and environmental alternatives to the traditional fluids (MPG) from the petrochemical industry and consequently support our customers in a sustainable process which was environment-friendly.

Innovation
Quality
Expertise
Safety

Nettogaz GC+: the innovative and responsible solution for the internal cleaning of refrigerated circuits

Climalife can help to ensure the sustainability of your installations and continue **to support you through regulatory change.**

NETTOGAZ reinvents itself and offers a sustainable alternative!

As with refrigerants, solvents containing fluorinated greenhouse gases are governed by European Regulation No. 517-2014, commonly called F-GAS II.

To comply with current regulations, Climalife was forward-thinking and developed **Nettogaz GC+**.

A mixture that does not affect the ozone layer and contains no fluorinated greenhouse gases, **Nettogaz GC+** replaces Nettogaz GC1. It is now establishing itself as a proven and effective solution for the internal cleaning of refrigerated circuits.



Advantages of Nettogaz GC+

The effective operation of a refrigeration system is dependent upon the internal cleanliness of its circuit. Impurities present in the circuit, whether they be water, solder residues or solid contaminants such as metal oxides, can cause system failures.

Today Climalife offers you Nettogaz GC+.

► It is easy to use thanks to the Climalife formulation and a specific nitrogen pressurised cylinder that gives it physical and chemical properties perfectly suited for this application.

► It is instantly effective: its cleaning power is linear and its Kauri Butanol index greater than 80 which allows us to confirm its high performance in eliminating impurities from circuits.
► It is completely safe and reliable: the product is non-flammable, non-toxic and does not contain fluorinated greenhouse gases or dangerous products.

Easy to use, effective and reliable, Nettogaz GC+ is the ideal solution for the internal cleaning of small volume refrigeration and air conditioning systems (for industrial applications see Facilisolv®).

Mantooth™: Take pressure and temperature measurements with your smartphone

The ManTooth™ wireless gauge connects to refrigeration and air-conditioning systems. With ManTooth™, no hoses or manifolds are necessary; your phone does the job thanks to a Bluetooth® connection. ManTooth™ is a wireless digital P/T Gauge that simplifies the pressure and temperature measurement of refrigeration and air-conditioning systems.

It calculates and displays the actual pressures, temperatures, superheat and sub-cooling in an easy to read colour format on IOS or Android™ devices.

The free to download ManTooth RSA app allows you to save pressure and temperature readings from your sessions which can be

automatically organised by location and unit being serviced. It can help to simplify future maintenance through its ability to share readings by e-mail and easily track and store service history.

The built-in schrader ports allow you to adjust the refrigerant charge if necessary.

ManTooth™ is the essential precision tool for refrigeration and A/C technicians replacing traditional manifolds.

Pressure sensing resolution	0.1 bar
Pressure sensing accuracy	0.5% at 25°C / ± 0.5% from 13 to 54°C / ± 1% from -40 to 120°C
Working pressure	0 - 48.3 bars
Proof pressure	68.9 bars
Temperature display resolution	0.1°C
Temperature sensor range / accuracy	- 40 to 130 °C / ±0.2°C



Dates for your diary!

France



Energy Efficiency Days

From September 2015, Climalife will be organising Energy Efficiency Days (L'efficacité Énergétique) in France – these will be interactive conferences covering issues relating to current market developments (regulatory, technical, economic). An overview of solutions and best practices for generating savings plus improving energy efficiency will be presented and illustrated by field study examples. The subjects will be dealt with in the form of interviews by a journalist. Make a note of the dates in your diaries and register via your Climalife representative.
- 22 September 2015 in Lyon
- 3 November 2015 in Paris

From 13 to 15 October: SIFA

SIFA, the inter-professional refrigeration and applications trade show, is the result of the merger between Energies Froid and Cold Chain Forum. It brings together 120 exhibitors and 5,000 visitors from 13 to 15 October 2015 at the Paris Event Centre, Porte de la Villette. Climalife will have a stand at this new event and will be presenting at workshops and conferences.



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INTERCLIMA+ELEC

From 2 to 6 November 2015, I, the three flagship construction exhibitions, BATIMAT, INTERCLIMA+ELEC and IDEO BAIN will take place at Paris Nord Villepinte.

Climalife will be exhibiting in Hall 2 Stand A030 in an area dedicated to refrigeration/air conditioning/heating. It's a unique occasion to explore our range of products and services for optimising thermal processes in the fields of commercial and industrial refrigeration, for the residential and service sectors

Switzerland

The next Swiss Cooling Expo will take place in Fribourg on **25 November 2015**. A Swiss exhibition for all stakeholders in the refrigeration and air conditioning, heating pumps and ventilation sector. The full Climalife team will welcome you on **Stand 19**.



Hungary

The Hungarian Refrigeration and Air Conditioning Association will hold its annual conference from **18 to 20 November 2015** at the Helikon hotel in Keszthely.

Climalife will have a stand and will be running technical presentations on new regulations and solutions adapted to these changes.

Europe

Voiles du Froid 2015: Thanks

On 5, 6, 7 June, Climalife and its loyal partners Assurroid, Clima+confort, Eurovent Certita Certification, GEA Heat Exchangers, Mobil SHC (Exxon Mobil), Honeywell, ITE, Le Snefcca and RPF, organised the 23rd Voiles du Froid event.

This event brought together over 150 refrigeration and air conditioning professionals and took place in friendly and sporting spirit between land and sea at the port of Seyne sur Mer on Ile des Embiez, in France. With radiant sunshine and occasional hesitant winds, the 19 individual crews sailed in First 31.7 vessels, competing in 5 races over the weekend. The valiant Paris 1 team took the Trophy, closely followed by the Rolesco boat, with the Centre vessel coming in 3rd place. Many thanks to all the participants and partners who contributed to the success of this wonderful European event.



International

COP21

Paris will host the 21st stakeholder conference (COP21) from **30 November to 11 December**. This conference aims to seek major international agreement on measures to be taken on climate change, in order to help keep global warming below 2°C.

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Solstice® range: low GWP HFO refrigerants are here!



Solstice® product

Solstice® N40 (R-448A)
GWP* = 1387



Traditional refrigerant replacement

R-404A



Applications

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

Benefit

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

Solstice® N13 (R-450A)
GWP = 605



R-134a



Medium temperature refrigeration
CO₂ cascade

- ODP = 0
- GWP is 58% lower than R-134a
- Non-flammable (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/zd/ze (IPCC revision 5)