climalife
Connect
THE MAGAZINE FOR AN ECO-EFFICIENT INDUSTRY

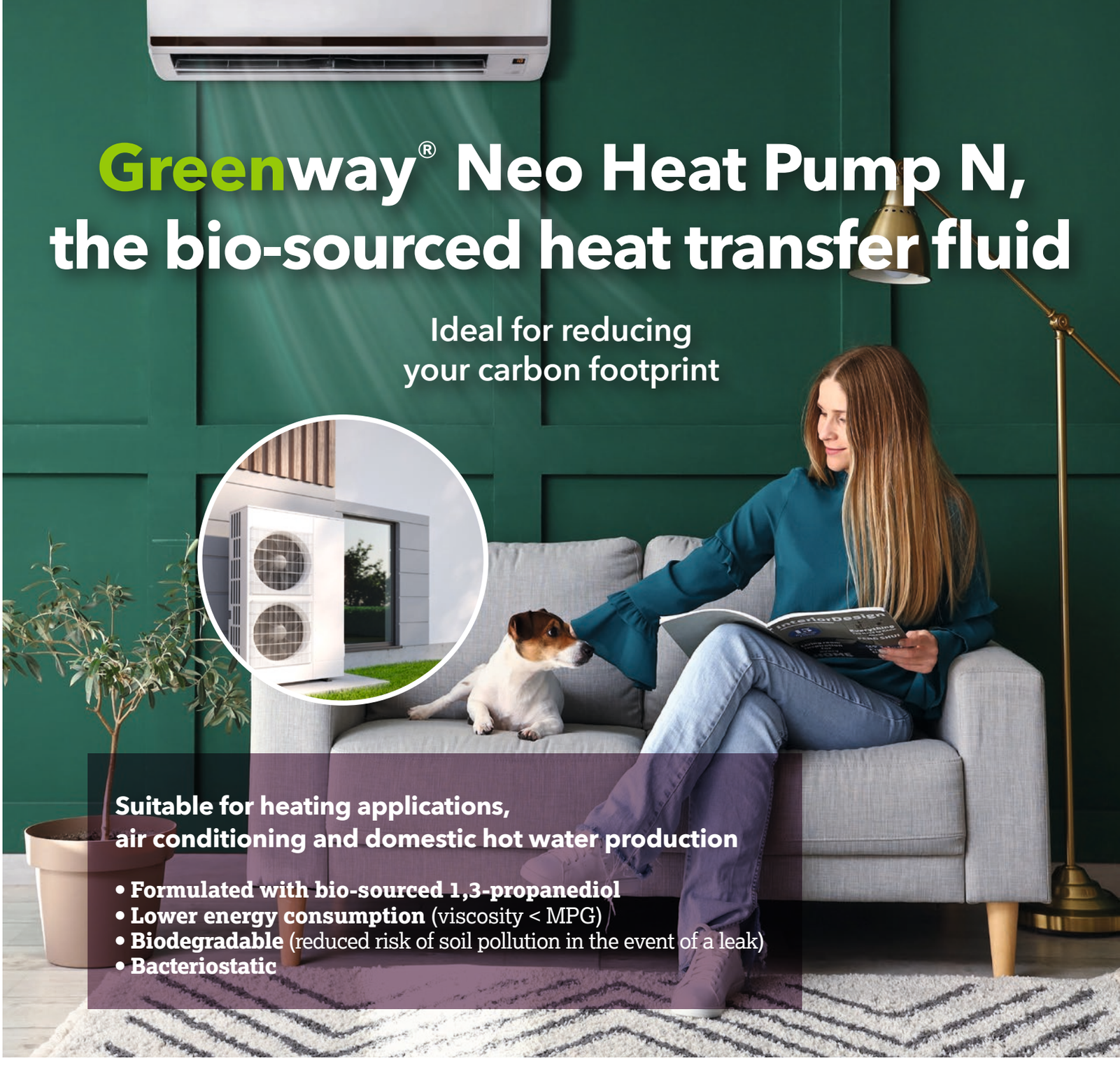
SEPTEMBER 2024

N° 24

F-Gas III: What's changing?

www.climalife.com

Price: €3



Climalife Connect
is published by Climalife, Groupe Dehon.
26, avenue du Petit Parc
F–94683 Vincennes Cedex
Tel.: + 33 1 43 98 75 00
Fax: + 33 1 43 98 21 51

• **Responsible for publication:**
Pierre-Olivier Dehon
• **Editor-in-Chief:**
Delphine Martin
E-mail: climalife.fr@climalife.dehon.com

• **Associate Editors:**
Emilie Kugener, Tosca Muyldermans,
Mel Summers, Neil Roberts
• **Design, production:**
www.alternactif.com

PEFC 10-31-1602
Certifié PEFC

• **Subsidiaries:**
• France: dehon service S.A.S. (Management and services) - climalife.fr@climalife.dehon.com
• Belgium: dehon service belgium - climalife.be@climalife.dehon.com
• The Netherlands: dehon service nederland - climalife.nl@climalife.dehon.com
• Germany: dkf - climalife.de@climalife.dehon.com
• Hungary: Climalife kft - climalife.hu@climalife.dehon.com
• Spain: friogas S.A.U - climalife.es@climalife.dehon.com
• United Kingdom: IDS Refrigeration Ltd - climalife.uk@climalife.dehon.com
• Switzerland: prochimac - climalife.ch@climalife.dehon.com
• Italy: Climalife Italia Srl - climalife.it@climalife.dehon.com
• Scandinavia: dehon nordic service - climalife.se@climalife.dehon.com
• Singapore: galco singapore branch climalife.sg@climalife.dehon.com
• Romania: Climalife Kft Budapesta Sucursala Bucuresti Romania - climalife.ro@climalife.dehon.com
• China: Climalife Asia Corporation - climalife.galco@climalife.dehon.com
• Export: galco - climalife.galco@climalife.dehon.com
• United Arab Emirates: Teknalys - climalife.ae@climalife.com

• **Photos:** AdobeStock, 512022356, 555701986, 887249126, Shutterstock, 1233562000, 1567464352, Freepik.

Any partial or total reproduction of an article must mention “source Climalife Connect” - ISSN 2801-8605

INNOVATION

F-Gas III: What's changing?

European Regulation (EU) 2024/573, commonly known as F-Gas III, came into force on 11 March this year, and new enforcement regulations continue to be published in the Official Journal of the European Union.

Its implementation is raising many questions in the industry where fluorinated greenhouse gases are in use, from the drastic restriction of quotas, bans on the marketing of products and equipment and bans on the use of certain fluids, in an economic environment disrupted by the rise of illegal trade.

However, the clock is ticking on the transition from today's fluids to solutions with a very low global warming potential (GWP < 150), which will enable us to meet regulatory constraints and, above all, meet the challenge of decarbonising our economy.

The recovery and reclamation of fluorinated greenhouse gases are also essential ways of meeting the requirements of F-Gas III and achieving the carbon neutrality goal.

Climalife supports its customers in this change by offering educational tools such as the F-Gas Solutions application, and by providing solutions through energy efficiency, refrigerant life-cycle management, leakage minimisation and bio-based alternatives.

The Chillventa trade fair, which opens its doors on 8 October in Nuremberg, will be a great opportunity to talk to our experts about the challenges ahead and find out more about our comprehensive range of products and services.

Happy reading!

Delphine MARTIN,
Global Marketing Manager

+ *Find us every day at climalife.com*

Summary

THE MAGAZINE FOR AN ECO-EFFICIENT INDUSTRY

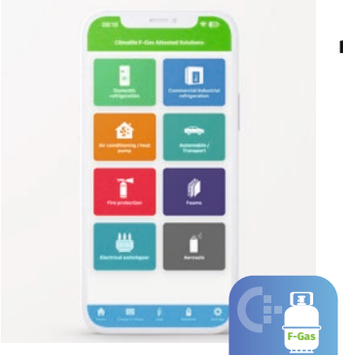
THE BUSINESS APPROACH

16

PRODUCT FOCUS

15

THE BUSINESS APPROACH



19

DIGITAL CONNECT

NEWS BY CLIMALIFE

Find all the news about Climalife on social media

climalife.com

FIND US ON:

@climalife

F-Gas III: what are the key points

of the new regulation?

— The new European regulation (EU) 2024/573 known as "F-Gas III" regulation on fluorinated greenhouse gases was published in the Official Journal of the European Union on 20 February 2024 and has been applicable since 11 March.

It replaces and repeals Regulation (EU) 517/2014 with a number of changes that are important to consider.

For your guidance, Climalife has highlighted the significant differences from the previous regulation in this article. However, the information given should not be taken in isolation without consulting the regulation.

Refrigerants covered by F-Gas III

F-Gas III covers all fluorinated greenhouse gases, including HFCs, HFOs, HFC/HFO blends, PFCs, HFEs and SF_6.

However, depending on the nature of the fluid, not all fluorinated gases are considered in the same way under the new regulation. The HFCs (Hydrofluorocarbons) listed in Annex I are subject to the gradual elimination of their placing on the market. The HFO[1] (Hydrofluoro-olefins) listed in Annex II are excluded. The quota reductions and the costs of allocating quotas apply only to the substances in Annex I, Section 1 (i.e. HFCs and/or HFC-based blends).

The GWP value to be taken into account

The GWP value will depend on whether the substance is listed in Annex I or Annex II.

The GWP of HFCs is still calculated according to the 4th assessment report (AR4) drawn up by the Intergovernmental Panel on Climate Change (IPCC), while the GWP of HFOs and non-fluorinated gases is now based on the 6th assessment report (AR6).

Annex I	
HFC	GWP AR4
R-23	14800
R-32	675
R-125	3500
R-134a	1430
R-227ea	3220

Annex II	
HFO	GWP AR6
R-1234yf	0.501
R-1234ze	1.37
R-1233zd	3.88
R-1336mzz(Z)	2.08

This means that a specific GWP calculation must be carried out for blends. This will be equal to the sum of the % of the substances that make up the blend multiplied by their respective GWPs (including substances that are not fluorinated greenhouse gases).

For example, R-448A has the following composition:

- R-32 (26%) / R-125 (26%) / R-1234yf (20%) / R-134a (21%) / R-1234ze (7%)

- Its GWP will be calculated as follows: (0.26 x 675) + (0.26 x 3500) + (0.2 x 0.501) + (0.21 x 1430) + (0.07 x 1.37) = 1386

1 Note that in F-Gas III, the hydrofluoro-olefins (HFOs) listed in Annex II section 1 are referred to as HFC-xxx.

Certification and training

The new regulation requires certification or a training certificate for fluorinated greenhouse gases. **This training must, however, include non-fluorinated refrigerants such as CO_2 or hydrocarbons** and take into account measures to improve or maintain energy efficiency. The training attestation obtained by companies under the previous regulation remains valid.

The training attestation is no longer valid for life. **By 12 March 2029 at the latest**, people who have certificates or attestations under the previous regulations, as well as those who do not, will have to take part in refresher courses or pass an assessment at **least every 7 years**.

Leak control

All equipment with a charge equal to or greater than 5 t. CO_2 eq. or 1 kg HFO must undergo a leak test.
As in the previous regulation, all equipment with a charge of 500 t. CO_2.eq. or more must be fitted with a fixed leak detector (indirect measurement system in France). It is important to note that leak detection systems must be checked at least once every 12 months to ensure that they are working properly.

Type of gas	Equipment charge	Frequency of leakage checks	
		Without fixed leak detection system	With fixed leak detection system
HFCs & HFC / HFO blends	5 t. CO_2 eq. ⩽ charge < 50 t. CO_2 eq.[1]	12 months	24 months
	50 t. CO_2 eq. ⩽ charge < 500 t. CO_2 eq.	6 months	12 months
SF_6 & g^3	Charge ⩾ 500 t. CO_2 eq.	3 months [2]	6 months Indirect leak detection system [2]
HFO	1 kg ⩽ charge < 10 kg [1]	12 months	24 months
	10 kg ⩽ charge < 100 kg	6 months	12 months
	Charge ⩾ 100 kg	3 months [2]	6 months Indirect leak detection system [2]

[1] Except for:
- hermetically sealed equipment < 10 t. CO_2 eq. or < 3 kg installed in residential buildings.
- will apply from 12 March 2027 for refrigeration units in refrigerated light commercial vehicles, intermodal containers, refrigerated containers and refrigerated wagons, air conditioning and heat pumps in heavy commercial vehicles, vans, non-road mobile machinery used in agriculture, mining and construction, trains, metros, trams and aircraft.

[2] In France, there is an exemption in cases where it is impossible to install an indirect leak detection system and where an ambient controller, which would then be compulsory, would not be suitable (e.g. roof top) and except for mobile equipment (e.g. refrigerated trailer).

Electrical switchgear does not have to be checked for leaks if it meets one of the following conditions:
(a) it has a tested leakage rate of less than 0.1% per year, as indicated in the manufacturer's technical specifications, and is labelled accordingly;
(b) it is fitted with a pressure or density control device with an automatic warning system during operation;
(c) it contains less than 6 kilograms of SF_6 or g^3.

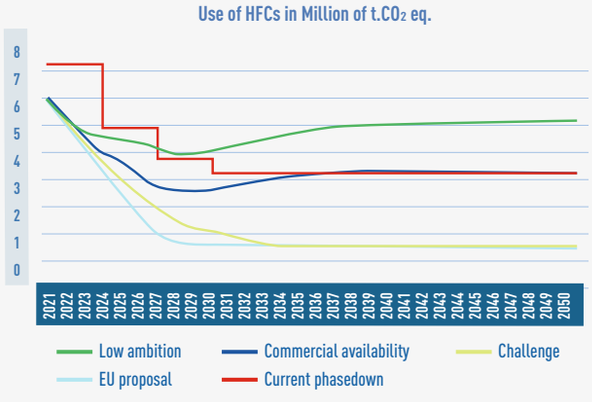
For **fire protection equipment**, existing inspection regimes must comply with ISO 14520 or EN 15004 and be inspected as often as required by the table above.

Review of fluorinated greenhouse gases in Great Britain

The government department responsible for reviewing F-Gas legislation is Defra. Defra has stated that there would be no new legislation before 2025 and that "any changes we may propose will be focused on the specific needs and opportunities of the UK market".

Defra has held public and private meetings with stakeholders and continues to work out the details. There is no firm indication yet but a report published by Defra in December 2022 included the following graph setting out different scenarios. It is clear from the discussions that the final decision will be a difficult one for the industry to make, unless the move to low or very low GWP fluids is made without delay.

The GB Government is due to publish the GB F-Gas proposal in 2024. If a public consultation is launched it is essential that the GB industry stakeholders respond to ensure that a viable proposal is developed for the future.



Phased emission reduction scenarios from the fluorinated greenhouse gases review report

The HFC quota timetable

In this new regulation, particular attention must be paid to the new quota timetable for placing HFC fluids on the market from 2025. The reduction of HFC quotas in t. CO_2 eq. equivalent in F-Gas III is more drastic and goes beyond the 2030 deadline of the previous regulation.

The F-Gas II timetable reduced the quantities placed on the market to 38 million t. CO_2 eq. by 2030, whereas the new timetable requires a reduction in quantities to 9 million t. CO_2 eq. by 2030, with a view to achieving zero HFCs by 2050.

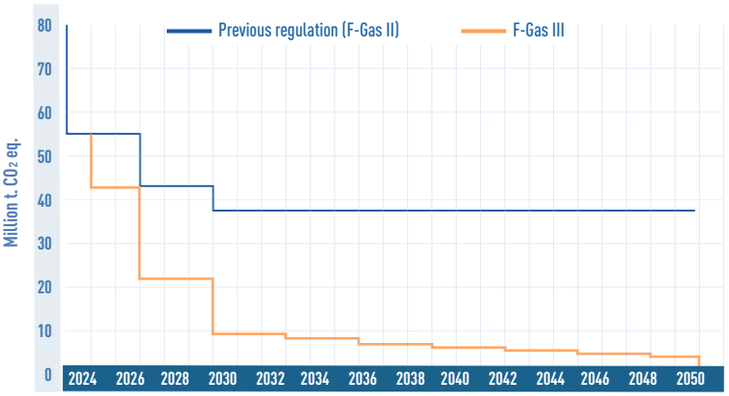
Clearly, the aim of this new regulation is to move to low or very low GWP solutions for new equipment as quickly as possible.

It is important to note that **HFO fluids such as R-1234yf or R-1234ze are not affected by this quota and final elimination**.

• Maximum quantity of HFCs placed on the market per year

Years	Maximum quantity in tonnes of CO_2 equivalent
2025-2026	42,874,410
2027-2029	21,665,691
2030-2032	9,132,097
2033-2035	8,445,713
2036-2038	6,782,265
2039-2041	6,136,732
2042-2044	5,491,199
2045-2047	4,845,666
2048-2049	4,200,133
From 2050	0

• Timetable for the reduction in HFC quotas (Annex I)



Placing on the market bans for products and equipment
Restrictions on use of certain refrigerants

To summarise the bans on the marketing of products and equipment, Climalife has created the diagrams below, incorporating the bans on the use of certain fluids.
Please note: recovered fluorinated gases may only be used for refilling or recharging equipment if they have been recycled or reclaimed. Operators of any equipment of a type not previously listed that contains fluorinated greenhouse gases must make arrangements to recover the fluorinated greenhouse gases, unless it can be shown that this is not technically feasible or would involve disproportionate costs. From 1st January 2025, building owners and contractors must ensure that panels or foam boards containing F-Gases are removed during renovation, refurbishment or demolition activities, unless it can be demonstrated that this is not technically feasible.

Stationary refrigeration

	01/01/2022	01/01/2025	01/01/2030	01/01/2032
New equipment	Multi-pack centralised refrigeration systems for commercial use ≥ 40 kW prohibited if containing HFC or blend with HFCs with a GWP ≥ 150 except in the primary refrigeration circuit of cascade systems: GWP < 1,500 authorised until 31/12/2029.	GWP < 150 mandatory for new self-contained refrigeration equipment for commercial use. GWP < 150* mandatory for other new self-contained refrigeration equipment.	GWP < 150 mandatory for all refrigeration equipment*.	
Service & maintenance		Virgin fluid with GWP ≥ 2,500 prohibited for servicing and maintenance of all refrigeration equipment (except military and for cooling products) < -50°C until 31/12/2029).		Virgin fluid with a GWP > 750 prohibited for the servicing and maintenance of fixed refrigeration equipment, with the exception of chillers, military and nuclear equipment.
	All reclaimed or recycled fluids are permitted.		Reclaimed fluids[1] or recycled[2] permitted for servicing and maintenance if GWP < 2500.	

** Except when required to meet safety requirements.* ***1. Reclaimed:*** *for the servicing or maintenance of any existing refrigeration equipment.* ***2. Recycled:*** *only for the maintenance or servicing of existing refrigeration equipment, provided that it has been recovered from such equipment. These recycled gases may only be used by the company that recovered them as part of servicing or maintenance, or by the company for which the recovery was carried out as part of servicing or maintenance.*

Placing on the market bans for products and equipment
Restrictions on use of certain refrigerants

Chillers

New equipment

01/01/2025	01/01/2027	01/01/2032
	GWP < 150* mandatory for new chillers ⩽ 12 kW. GWP < 750* mandatory for new chillers > 12 kW.	Total ban on the use of of fluorinated fluids (HFC, HFO) for new chillers ⩽ 12 kW*.

Service & maintenance

Virgin fluid with GWP ⩾ 2,500 prohibited for servicing and maintenance of all refrigeration equipment (except military and for cooling products < -50°C until 31/12/2029).

All reclaimed or recycled fluids are permitted.

Reclaimed fluids[1] or recycled[2] authorised for servicing and maintenance if GWP < 2500.

Stationary air conditioning and self-contained heat pumps (Monoblocs)

New equipment

01/01/2026	01/01/2027	01/01/2030
	GWP < 150** mandatory for plug-in air conditioning equipment, monoblocs and other self-contained air conditioning equipment and heat pumps ⩽ 12 kW. GWP < 150** mandatory for monoblocs and other self-contained air conditioning and heat pump equipment > 12 kW and ⩽ 50 kW.	GWP < 150* mandatory for other self-contained equipment air conditioning and heat pumps.

Service & maintenance

Virgin fluid with a GWP ⩾ 2,500 prohibited for the servicing and maintenance of air conditioning equipment and heat pumps.

All reclaimed or recycled fluids are permitted.

Stationary air conditioning and heat pump split systems (Mono and multi)

New equipment

01/01/2025	01/01/2026	01/01/2027	01/01/2029
GWP < 750 mandatory for single split systems < 3 kg.		GWP < 150* mandatory for all systems air-water split ⩽ 12 kW.	GWP < 150* mandatory for all air-air split systems ⩽ 12 kW. GWP < 750* mandatory for all split systems >12 kW.

Service & maintenance

Virgin fluid with GWP ⩾ 2,500 prohibited for the servicing and maintenance of air conditioning equipment and heat pumps.

All reclaimed or recycled fluids are permitted.

Definition of regulations "chiller": a single system whose primary function is to cool a heat transfer fluid (such as water, glycol, brine or CO_2) for refrigeration, process, preservation or comfort purposes.

Foams

01/01/2023

HFCs, HFOs and HFC/HFO blends with a GWP < 150 mandatory for all foams, except where necessary to meet national safety standards.

01/01/2033

Total ban on fluorinated gases (HFC, HFO) for all foams, except where necessary to meet safety requirements.

01/01/2032

Total ban on the use of fluorinated fluids (HFC, HFO) for new chillers ≤ 12 kW*.

Plug-in air-conditioning equipment, single-package, and other self-contained heat pump equipment ≤ 12 KW**.

Reclaimed fluids[1] or recycled[2] permitted for servicing and maintenance if GWP < 2500.

** Except when required to meet safety requirements.*
*** Except when required to meet safety requirements the GWP limit is < 750.*

*1. **Reclaimed:** for servicing or maintaining any existing refrigeration equipment.*

*2. **Recycled:** only for the maintenance or servicing of existing refrigeration equipment, provided that they have been recovered from such equipment. These recycled gases may only be used by the company that recovered them as part of servicing or maintenance, or by the company for which the recovery was carried out as part of servicing or maintenance.*

01/01/2032

01/01/2033

GWP < 150* mandatory for all split systems >12kW.

01/01/2035

Total ban fluorinated gases (HFC, HFO) for all split systems ≤ 12kW*.

Reclaimed fluids[1] or recycled[2] permitted for servicing and maintenance if GWP < 2500.

Placing on the market bans for products and equipment
Restrictions on use of certain refrigerants

Electrical switchgear: new equipment restrictions

01/01/2026

Total ban on fluorinated gases for medium-voltage switchgear for primary and secondary distribution ≤ 24 kV* (SF_6 & g^3).

01/01/2028

52 kV < high-voltage switchgear ≤ 145 kV & ≤ 50 kA short circuit current containing fluorinated gases of which GWP ≥ 1* (Prohibition SF_6 & g^3).

01/01/2030

Total ban on fluorinated gases 24 kV < medium-voltage switchgear for primary and secondary distribution ≤ 52 kV* (Prohibition SF_6 & g^3).

01/01/2032

Switchgear High voltage > 145 kV or > 50 kA short circuit current containing fluorinated gases with a GWP ≥ 1* (SF_6 and g^3 banned).

01/01/2035

The use of virgin SF_6 & g^3 for the servicing or maintenance of electrical switching equipment is prohibited, unless justified for technical reasons.

Reclaimed SF_6 and g^3 permitted.

*Except for: **a)** eco-designed equipment or; **b)** if the order was placed before the regulations became applicable. **Exemptions:** Switchgear containing fluorinated gases with a GWP < 1,000 (g^3) is permitted if it is subject to a tender procedure and if: • no offer without fluorinated gases has been received for medium-voltage switchgear for primary and secondary distribution ≤ 52 kV; • no offer without fluorinated gases with a GWP < 1 has been received for high-voltage switchgear; • no offer has been received with fluorinated gases with a GWP < 1 and; by way of derogation, the commissioning of electrical switchgear using a fluorinated gas with a GWP ≥ 1,000 is authorised if, following a procurement procedure, no tender has been received.*

** Except when required to meet safety requirements.* ***1. Reclaimed:*** *for the servicing or maintenance of any existing refrigeration equipment.* ***2. Recycled:*** *only for the maintenance or servicing of existing refrigeration equipment, provided that it has been recovered from such equipment. These recycled gases may only be used by the company that recovered them as part of servicing or maintenance, or by the company for which the recovery was carried out as part of servicing or maintenance.*

Fire protection: restrictions on new equipment

New equipment

01/01/2016

HFC R-23 is banned for new fire protection equipment.

Mid 2024*

01/01/2025

Ban on HFCs for new fire protection equipment, except where they are necessary to meet the requirements of the European Union safety requirements (virgin R-125 and R-227ea prohibited).

Service & maintenance

All reclaimed or recycled fluids are permitted.

** Halon - Revision of the ODS regulation: from mid-2024, it will be prohibited to destroy halons in order to preserve non-virgin stocks for exempted critical uses and thus avoid the need to restart halon production for such uses.*

Aerosols

01/01/2018

HFCs, HFOs and HFC/HFO blends with a GWP < 150 mandatory for technical aerosols*.

HFC and H(C)FO authorised for MDIs.

01/01/2025

Total ban on fluorinated gases (including HFO) for personal care products (foams, creams, mousses, liquids or sprays).

GWP <150 mandatory for equipment used to cool the skin* (e.g. "magic spray" for footballers).

HFC and H(C)FO authorised for MDIs.

HFCs for MDIs included in the global quota quantities.

01/01/2028

HFC and H(C)FO authorised for MDI.

01/01/2030

Total ban on fluorinated gases (including HFOs) in technical aerosols*.

HFC and H(C)FO authorised for MDIs.

• MDIs: metered dose inhalers.
** Except when required to meet safety requirements or when used for medical applications.*

Hyper U in Porto Vecchio chooses R-455A to optimise the total cost of ownership of its refrigeration system

Mecafroid installs two chillers for medium temperature refrigeration and a direct-expansion unit for low temperature refrigeration, all using Solstice® L40X to replace R-404A installations.

We head to the beautiful island to discover this first hypermarket installation built using R-455A entirely, a refrigerant with a very low GWP (146) distributed by Climalife and produced by Honeywell.

With a surface area of 4,200 m², the Porto Vecchio hypermarket is located close to the coast, attracting 3,000 customers a day, rising to more than 5,000 during the summer months. The shop has undergone a number of renovations over the past twenty years, with extensions and changes in configuration depending on the retailer, while retaining its R-404A direct expansion refrigeration units.

Faced with the F-Gas III regulations and restrictions on the marketing of equipment and products, the issue of replacing the refrigeration systems came up very quickly when the Hyper U chain bought the shop in 2023. The new owner, Eric Cascio, and his manager Franck Marrot, advised by their installer Mecafroid, were well aware of this problem when drawing up the specifications for the refurbishment of this superstore.

Renovation work on the hypermarket's layout would also be carried out to bring it into line with the U concept and current consumer trends.

The "market" style had to be reflected in the fresh produce area, with the fruit and vegetables, butcher's, delicatessen, pre-prepared meals and cheese areas enlarged to improve circulation in the space. In order to meet regulatory requirements, and, above all, reduce the hypermarket's electricity consumption which amounts to more than €200k a year, the enclosing of units with doors was also a key part of the refurbishment.

The Nîmes-based consultancy Garcia was asked to study the possibility of changing the refrigeration system and to propose a new alternative to R-404A.

The choice of technology

Choosing a refrigeration system has become a strategic decision in terms of environmental and financial impact for supermarket chains. Different architectures are being considered to cover refrigeration needs.

A transcritical CO_2 system option was quickly ruled out by the parties involved, even though they were already used to using R-744 on other projects. *"Given the shop's location in southern Corsica, the energy performance of the CO_2 system could be compromised,"* points out Paul Trojani, head of Mecafroid.

"Indeed, installing a CO_2 system in a hypermarket where summer temperatures can be very high is still complicated today, and has not been fully understood when you look at the feedback from existing similar installations," explains Eric Cascio, who already owns a Super U in Sainte Lucie and a Marché U in Sagonne. And when it comes to emergency maintenance, the island's specific conditions don't really lend themselves to it, not to mention the increased energy requirements during the summer months with the influx of tourists.

The alternative is to use synthetic refrigerants with a very low environmental impact, while keeping investment (CAPEX) and operating (OPEX) costs under control and ensuring the reliability and safety of the refrigeration system.

R-455A: the winning combination against CO_2

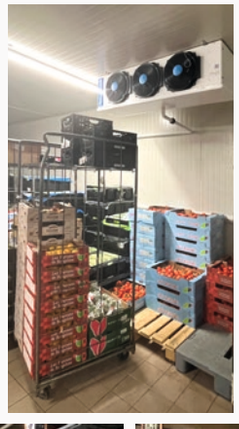
Ultimately, the choice fell to a 61 kW direct expansion plant equipped with 5 Bitzer compressors for low-temperature cooling and a chilled water loop for medium-temperature cooling with two AF-Energy chillers of 150 kW per unit, all using Solstice® L40X, a mildly flammable refrigerant (A2L) designed for new low- and medium-temperature installations. With a very low GWP, R-455A is an F-Gas III-approved long-term solution. And its refrigeration capacity close to R-404A, high energy efficiency, high critical temperature and low critical pressure make it an ideal choice for this commercial refrigeration application. What's more, Solstice® L40X is easy to install and maintain, making it accessible to all technicians, a significant advantage when it comes to responding to emergencies.

An ambitious project in a very short space of time

At the end of December, the order was signed and the work had to be completed in seven weeks, with a mandatory reopening date of 26 February 2024 to meet the owner's wishes. The entire installation was designed by Savoie-based refrigeration equipment manufacturer AF Energy, which also specialises in regulation and supervision for supermarkets.

The two chillers, each containing 108 kg of R-455A, produce continuous cooling for greater reliability and supply a common 2,000-litre storage tank with two secondary pumps per circuit, one for the medium temperature cold rooms and the other for the Exkal medium-temperature display cabinets, all with a common return. The glycol water network is charged with 9m³ of Friogel® Neo -18°C, a refrigerant produced by Climalife for a -4°C / -8°C operation. The choice of the water loop offers the advantage of being able to modulate the layout of the shop if necessary and, above all, to reduce and confine the refrigerant charge in the machine room, which simplifies the search for leaks, points out Stéphane Chapuis, the Mecafroid technician in charge of managing this project. Danfoss three-way valves have been installed on each piece of equipment for greater flexibility in the event of a line failure. This also means that the display cabinets can be converted into dry sales units during the winter, when there is less need.

The low temperature plant operates at -32°C / +45°C with a charge of 215 kg of R-455A and supplies Carrier display cabinets and low temperature cold rooms.


— Description of the new installation with Solstice® L40X (R-455A)

- **Medium temperature display cabinets (Exkal brand)**
  - Power rating: 160 kW
  - 210 linear m
- **Low temperature display cabinets (Carrier brand)**
  - Power: 28 kW
  - 48 linear m
- **Medium temperature cold rooms**
  - Power: 154 kW
  - Number of evaporators: 35
- **Low temperature cold rooms**
  - Power: 24 kW
  - Number of evaporators: 3
  - Display case and cold room control: NINO AF-Energy
  - Machine automation: M172 Schneider
  - Framing: K2 AF-Energy
  - Electrical cabinets: AF-Energy
- **AF-Energy medium temperature chiller**
  - Number: 2
  - Capacity: 150 kW (per unit)
  - Friogel® Neo refrigerant: MPG 35
  - Speed: - 4 /- 8°C
  - Refrigerant: R-455A
  - Evaporation temperature -11°C

  - ***Refrigeration by chiller:***

  3 Bitzer 4FE-35Y compressors
  1 variable speed drive Bitzer FPW-61
  1 SWEP plate evaporator
  1 Siemens electronic expansion valve
  2 emergency mode thermostatic expansion valves
  1 oil separator + level regulators
  1 condenser 5 fans 700 rpm dt = 8°C with LCE coil treatment
  2 primary pumps
  1 emergency operation pressure switch

  - ***Distribution:***

  1 2000 L storage tank
  2 secondary "showcase" pumps on variable speed drive
  2 "Cold room" secondary pumps on variable speed drive
- **AF-Energy low temperature power plant**
  - Direct expansion
  - Refrigerant: R-455A
  - Capacity: 61 kW
  - Evaporating temperature: - 35°C

  - ***Refrigeration section:***

  5 Bitzer 4FE-28Y compressors
  1 variable speed drive Bitzer FOY-46
  1 shock bottle
  1 liquid tank 90L
  1 oil separator + level regulators
  1 condenser 3 fans 700 rpm dt = 8°C with LCE coil treatment
  1 emergency pressure switch
- **DESP fluid Group 1**

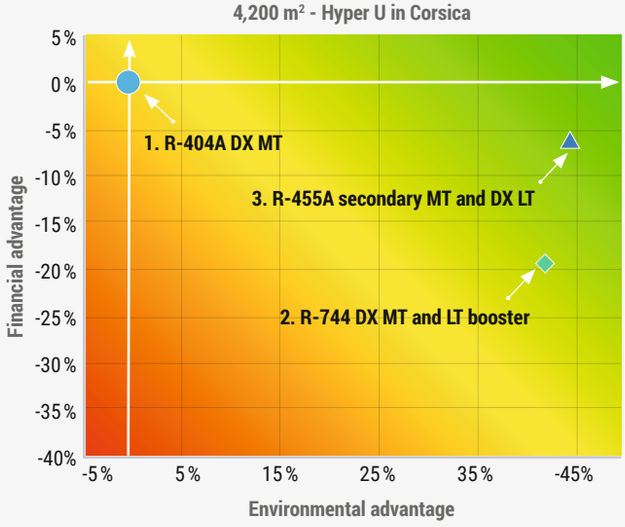
From left to right: **Stéphane Chapuis**, Technician at Mecafroid, **Mohammed Youbi-Idrissi**, Technical Leader EMEA at Honeywell, **Eric Cascio**, Owner and **Franck Marrot**, Manager of Hyper U in Porto Vecchio, **Paul Trojani**, Director of Mecafroid, **Daniel Dias**, Business Development Manager at Climalife.

A fixed detector has been installed in the machine room to comply with regulations. The plant's noise level has been reduced by limiting the roof-mounted condensers to 80% and by fitting the machine room with a sound trap to protect the neighbourhood. Heat recovery from the refrigeration units has not been implemented, as recent roof top units provide heating and air conditioning for the hypermarket.

All those involved in the project are very pleased with the choice of architecture.

Even with high outside temperatures, the coefficient of performance remains good, the risk of goods being lost is minimised and the water loop solution has no impact on energy consumption compared with a CO_2 system, concludes Mohammed Youbi Idrissi, Technical Leader EMEA at Honeywell, who explains that secondary refrigeration generally offers two advantages: even distribution of the refrigerant in the refrigeration exchangers and much lower energy consumption for defrosting.

Eco-efficiency simulation for Hyper U in Porto Vecchio



Eco-efficiency modelling confirms choice of new Hyper U architecture and Solstice® L40X refrigerant

Assuming a refrigeration system lifetime of 10 years and an annual leakage rate of 15% for the different architectures, the total cost of ownership (CAPEX + OPEX) is lower than for a CO_2 transcritical system. The financial gain is close to €200k. The environmental impact is also reduced.

Solstice® L40X is a durable, high-performance F-Gas III-approved refrigerant.

PROJECT STAKEHOLDERS

- **MECAFROID:** Commercial Refrigeration, Air Conditioning, Installation & Maintenance.
- **Location:** Corsican head office in Bastia and a branch in Ajaccio, France
- **Year of creation:** 1972
- 20 employees

- **Hyper U:** French supermarket chain.
- **Location:** Porto-Vecchio, France
- 136 employees

- **AF-Energy:** Assembly of process machinery for refrigeration, air conditioning and heating.
- **Location:** Sainte-Hélène-Du-Lac, France
- **Year of creation:** 2016
- 25 employees

ARCHITECTURE Installation	CAPEX	CAPEX	OPEX ELECTRICITY	OPEX ELECTRICITY	OPEX Maintenance	OPEX Fluid refill	∑ OPEX	CAPEX + OPEX	CO_2 EMISSIONS from the electricity generation plant	CO_2 EMISSIONS from refrigerant leaks	∑ CO_2 EMISSIONS
[-]	[€]	[%]	[€]	[%]	[€]	[€]	[€]	[€]	[t. CO_2]	[t. CO_2]	[t. CO_2]
1. R-404A DX MT and LT	240,000	100.0%	1,044,236	100.0%	28,704	93,345	1,166,285	1,406,285	5,952	5,952.15	11,904
2. R-744 DX MT and LT booster	390,000	162.5%	1,208,285	115.7%	47,834	31,238	1,287,357	1,677,357	6,887	1.56	6,889
3. R-455A secondary MT and DX LT	300,000	125.0%	1,152,879	110.4%	29,784	11,470	1,194,132	1,494,132	6,571	24	6,595

Froid Polaire introduces Solstice® N40 in Morocco to reduce carbon footprint

Construction of an R-448A cold store for the JALAL Group, distributor of Danone dairy products in the Souss Massa region.

The decarbonisation of Moroccan industry represents a major challenge for improving competitiveness, accessing new markets and accelerating the energy transition. Casablanca-based installer Le Froid Polaire is seizing this opportunity to innovate and offer its customers new solutions with a lower environmental impact.
"R-404A is currently the main refrigerant used on the Moroccan market. We have no regulatory restrictions on this fluid as in Europe, but we must all contribute to the fight against global warming. Offering R-448A is a first step towards reducing the carbon footprint and improving the energy efficiency of refrigeration systems", explains Youssef Anouari, manager of Le Froid Polaire.

Construction of a 576m³ medium temp cold room

A distributor of refrigeration components and installer throughout France, Le Froid Polaire was consulted last year by the Jalal group on the construction of a cold store.

Founded in 1994, this family-run group specialises in the storage and distribution of products in the Souss Massa region of southern Morocco. In the midst of rapid growth, the group decided to invest in a new 5,000 m² storage platform on a two-and-a-half hectare site in Taroudant, a strategic location to facilitate the dispatch of goods.

To meet the needs of LDC (Leading Distribution Company), one of the entities in charge of distributing Danone products, a 600 m² area was allocated. In this part of the warehouse, a cold room had to be capable of storing all the fresh products in the range (yoghurts, fermented milk, butter, etc) at a temperature of +4°C / +6°C. Several quotes were submitted. Le Froid Polaire won the contract for its technical support and environmental solution. Work began in September 2023.

A 576 m³ cold store equipped with two Tecumseh EV-UNIT-H-21. 3/105 evaporators was built. It is supplied

by two condensing units, each fitted with a Frascold compressor with a unit capacity of 23.67 kW, operating at -10°C / +53°C, with a 35 kg charge of R-448A (Solstice® N40). This refrigerant, distributed by Climalife, was selected for its lower GWP and better coefficient of performance. Replacing R-404A with R-448A reduces energy consumption by an estimated 9% and cuts total CO_2 emissions by 22%.

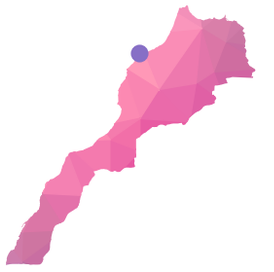
Initiatives to kick-start decarbonisation

This innovation enables the Jalal Group to pursue its commitment to decarbonising its activities in addition to other initiatives already being considered and/or requested by its suppliers. *"We work mainly with multinational companies, that are already asking us to take steps to reduce our carbon footprint. To distribute their brands, this will become a prerequisite. We have already started to replace part of our fleet with hybrid vehicles. We're thinking about introducing a system to recycle water, which is in short supply in our region,"* says Abdelilah Jalal, the group's CEO. *"And reducing the energy consumption of our refrigeration system will be positive in meeting the requirements"* concludes Noureddine Jalal, the group's chairman. ■

	R-404A installation	R-448A installation	Difference
Total energy consumption (MWh)	1.24 MWh	1.128 MWh	-9 %
Direct CO_2 emissions from leaks* (tonnes CO_2)	412 t CO_2	152 t CO_2	-63 %
Indirect CO_2 emissions linked to energy consumption (tonnes CO_2)	1209 t CO_2	1100 t CO_2	-9 %
Total CO_2 emissions (tonnes CO_2)	1621 t CO_2	1253 t CO_2	-22 %

**10% annual leakage rate*

Replacing R-404A with R-448A allows:
- a 9% reduction in energy consumption
- a 22% reduction in total CO_2 emissions



PROJECT STAKEHOLDERS

- **Le Froid Polaire:** Distributor of refrigeration components and installer of refrigeration and air conditioning systems.
- **Location:** Casablanca, Morocco
- **Year of creation:** 1996
- 22 employees
- **Website:** www.lefroidpolaire.com

- **Jalal Group:** Storage and distribution.
- **Location:** Taroudant, Morocco
- **Year of creation:** 1994
- 200 employees
- Turnover: €40 million

TO FIND OUT MORE
■ climalife.com/product/solstice-n40-r-448a

From left to right: Noureddine **Jalal**, Chairman of the Jalal Group, **Abdelilah Jalal**, CEO at Jalal, **Youssef Anouari**, Manager of Froid Polaire and **Delphine Martin**, Global Marketing Manager at Climalife.

Emmi Energy launches the first high-temperature heat pump using Greenway® Neo Heat Pump N

Designed for heating and domestic hot water without modifying the circuit, the Pompeii model makes sustainability accessible to everyone.

EMMI Energy began developing new high-temperature heat pump technology in 2019. Following tests in a climatic test chamber, generation 1 of Pompeii was operational in 2020. Since 2021, 40 heat pumps have been in operation in four groups of homes. The heat pumps are meticulously checked and adjusted, if necessary, based on data acquired by remote monitoring: *"These tests revealed some initial problems, all now resolved, except for the noise level. We therefore designed the second generation of Pompeii, where the noise level has been reduced to 35 dB (below the Dutch directive threshold of 40-45 dB),"* explains Denis Tien, technical engineer at EMMI Energy. This second generation of Pompeii is currently being tested in one of the housing units.

Boiler replacement in no time at all

The Pompeii heat pump is designed entirely with the circular economy in mind. For example, all parts are reusable and recyclable. CO_2 (R-744) is used as the refrigerant to achieve the high temperature. When CO_2 is compressed, a large amount of energy is released and the temperature soars. *"CO_2 is most cost-effective when operated at 85°C and a return temperature of around 40°C is obtained. Below 31°C, you get frost, which is not desirable,"* explains Denis.

By producing these high temperatures, the Pompeii heat pump can be connected to the home's existing heating elements. Almost all heating elements, such as radiators, underfloor heating and convectors, are suitable for this heat pump. This means there's no need to make any modifications other than replacing the central heating boiler.

Greenway® Neo Heat Pump N was chosen as the transfer fluid between the heat pump and the buffer tank. *"As the heat pump was designed using circular economy principles, it was important that the heat transfer fluid was also sustainable,"* explains Denis.

Perfect heat transfer

Denis was very satisfied, saying *"I had heard of the Greenway® Neo N range and couldn't find an equivalent alternative on the market. I had already tested another plant-based heat transfer fluid but it didn't meet our expectations. After our first tests with the Greenway® Neo Heat Pump N, we found that the heat transfer worked perfectly,"*.

"There are two connections from the heat pump to the buffer tank, to circulate the heat transfer fluid at 80-85°C, with a return temperature to the tank that must always be around 40°C. It's very important for us that the heat transfer medium remains stable throughout the process," explains Denis.

For EMMI Energy, the safety and renewable origin of Greenway® Neo Heat Pump N played a crucial role in the choice, taking into account its other advantages. This heat transfer fluid also contains a bittering agent to prevent accidental ingestion in the event of a leak in the drinking water network. And the plant-based and natural raw materials also reduce the risk of soil contamination.

A bright future

The next step will be to continue marketing the Pompeii heat pump. The hybrid version is currently seen as a boiler replacement solution, but this is only an intermediate step. With this new high-temperature Pompeii heat pump, EMMI Energy can simply replace the gas boiler. More than 2.2 million homes in the Netherlands are now in a position to adopt this solution. ■

PROJECT STAKEHOLDERS

- **EMMI Energy:** Distributor and developer of innovative heat pump technologies.
- **Location:** Terwolde, Netherlands
- **Year of creation:** 2019
- 3 employees
- **Website:** www.emmienergy.nl

INFO:

Greenway® Neo Heat Pump N is a plant-based heat transfer fluid containing organic 1,3-propanediol and powerful corrosion inhibitors. It protects against freezing and the formation of sludge in circuits.

FOR MORE INFORMATION

■ climalife.com/product/greenway-neo-heatpumpn-rtu

Specifications Pompeii model NO 8600-8C

Heating capacity	8.6kW	Min/max outdoor temperature	-25°C to +43°C
COP	3.4	Compressor	Panasonic
Type of heating	Indirectly via EMMI storage tank	Refrigerant	R-744 – 1100gr
Heat transfer fluid	Greenway® Neo Heat Pump N -18°C (volume 20L)	Noise level	35 dB(A)
Maximum outlet temperature	90°C		

Novexpans™ Range: expanding agents for polyurethane foam, polystyrene and polyethylene

Insulation conserves the energy produced by refrigerators, air conditioners and other equipment. It limits heat transfer between the outside and the inside. Good insulation therefore requires high thermal resistance and the lowest possible Lambda (thermal conductivity).

Our R&D team is constantly involved in developing new formulas and offers unique, innovative solutions to meet the needs of industries such as construction, automotive & transport, food and beverage.

- **Our added value lies in our knowledge of markets,** our know-how and our expertise in standards.

From 1-litre samples to bulk 20 tonnes, we offer a wide range of packaging to meet all your needs.

Our comprehensive range of products and services:

- **Pure blowing agents** (liquids or liquefied gases) or custom-made blends distributed in packaging complying with ADR regulations.
- **Analyses** (GC-MS, Karl Fischer, etc.).
- **Tailor-made** samples.
- **Regulatory expertise:** REACH, F-Gas, ADR, etc.
- **Engineering and services:** design and installation of storage tanks, blending and distribution systems, audit and expertise.

Discover our complete range
QR Code to the solution finder

Duonett®, the new liquid descaler for professional use

Developed for heat exchangers (condensers and water evaporators), boilers, water circuits and pipes, and cooling towers, Duonett® is a liquid descaler for industrial use designed to dissolve limescale and other pipe scales and remove sludge and rust deposits in water-carrying installations.

Duonett® offers a number of advantages:

- **Very effective against tartar:** dissolve 280g of tartar (calcium carbonate at 20°C) per litre of product.
- **Can be used for internal circulation** (pipes, etc.) and **external applications** (air exchangers, etc.).
- **Easy to use** and **biodegradable.**
- **Compatible** with copper, steel, stainless steel, iron, brass, zinc, aluminium, rubber, plastic and ceramics.

Duonett® is available in 5-litre and 20-litre cans or 225-litre drums.

This new formula replaces Duonett® D7.

TO FIND OUT MORE
climalife.com/product/duonett

SAMON GLACIÄR MIDI leak detectors: a reliable solution for a safe space

Whether it's a question of respecting the environment, limiting greenhouse gas emissions, increasing safety, maintaining optimum energy efficiency or limiting the costs associated with the loss of refrigerant, the benefits of fixed leak detection are numerous.

The SAMON GLACIÄR MIDI fixed leak detector is suitable for all commonly used refrigerants with 5 different sensor types. It is suitable for air conditioning and refrigeration installations (cold rooms, machine rooms, chillers, air conditioning systems, etc.).

The advantages of GLACIÄR MIDI detectors:

- **Simple commissioning:** connection, relays, connectivity, reliability.
- **Easy integration:** pre-calibrated sensors.
- **Simplified maintenance:** dedicated application, customisable reports.

Once the detector has been selected, installation is quick and easy and takes just 3 steps:

1 Choice of location

For optimum efficiency, a number of criteria need to be taken into account:

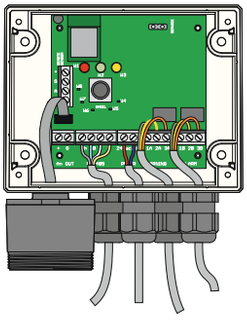
1. The characteristics of the refrigerant to be detected to determine the mounting height.

Type of gas	Mounting height
NH_3 Ammonia (R-717)	20 cm below the ceiling
HFC/HFO/C_3H_8 Propane (R-290)	20 cm above the floor
CO_2 Carbon Dioxide (R-744)	20 cm above the floor

2. Accessibility.
3. Air flow.

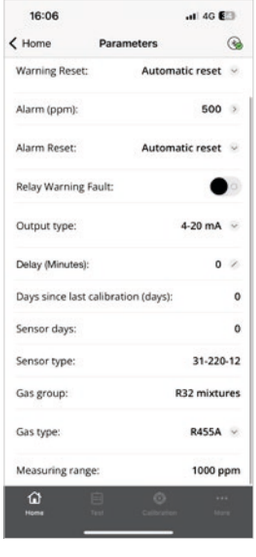
2 Connection

- An analogue output (selectable as required: 4-20mA, 0-10V, ...).
- A RS485 cable for the Modbus link.
- 2 relays.
- Accessories: audible and visual alarm.
- Remote probe option (up to 5 m).

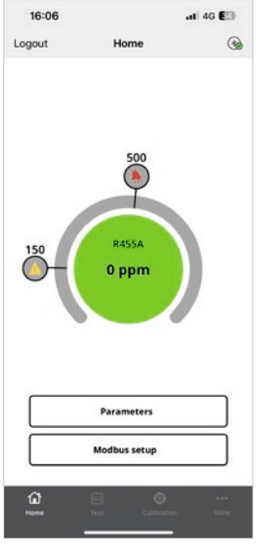


3 Configuration via mobile application

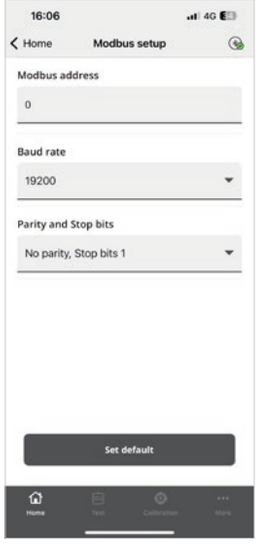
Parameter setting and fluid selection



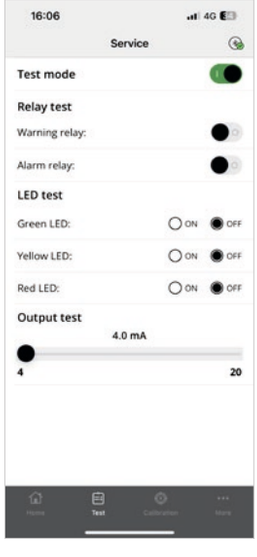
Choice of threshold and alarm level



Modbus configuration



Annual maintenance and calibration



Report generation

Events

Climalife looks forward to seeing you at some of the upcoming industry events.
Mark your calendars!

CHILLVENTA

From 8 to 10 October 2024
The World's leading trade fair for refrigeration technology
Nuremberg Exhibition Centre - Germany

The Climalife and Matelex team look forward to seeing you at Chillventa in **Hall 7 Stand 422**. Come and discover our latest **eco-efficient solutions** to meet the regulatory challenges of F-Gas III.

Mark your calendars! To find out more, attend our conferences:

- **09/10 from 10am to 10.20am - Hall 4A, stand 4A-419**
How can air conditioning and heat pumps contribute to the decarbonisation of buildings and meet European targets in line with F-Gas III?

- **09/10 from 3.20pm to 3.40pm - Hall 8, stand 8-516**
Practical tools to face F-Gas III.

- **10/10 from 10.40am to 11am - Hall 8, stand 8-516**
Reduce the environmental and financial impact of your refrigeration installations in 3 simple steps.

- **10/10 from 12 noon to 12.20 p.m. - Hall 7A, stand 7A-638**
What is the refrigeration of the future to help industries achieve carbon neutrality? What are the solutions for F-Gas III?

Information and registration:
www.chillventa.de/en

7 November 2024
Cool & Comfort Happening
Brabanthal Leuven - Belgium

To celebrate 25 years of Cool & Comfort, join us on a special day dedicated to refrigeration, ventilation and heat pump professionals.

Climalife looks forward to seeing you on **07/11 from 11:00 to 11:30 - Room 1 to attend the conference** on Very Low GWP Solutions in compliance with the new F-Gas III regulation.

Information and registration: www.coolandcomfort.be/nl/cchappening

From 13 to 14 November 2024
39th Hungarian Refrigeration and Refrigeration and Air Conditioning Conference
Sümeg, Hotel Kapitány - Hungary

HKVSZ Hűtő- és Klímatechnikai Vállalkozások Szövetsége

Climalife will be presenting F-Gas III-compliant solutions for achieving carbon neutrality in industry and decarbonising buildings.

SIFA

From 19 to 21 November 2024
Interprofessional trade fair for refrigeration and its applications *- Lyon, Eurexpo – France*

Climalife and its partners Honeywell, ExxonMobil and Matelex will welcome you at SIFA **Hall 7 Stand D42** to discuss the latest market trends.

Find our conference programme at climalife.com
Information and registration: www.expo-sifa.com/en

INSIDE News

The Dehon Group celebrates its 150th anniversary!

Climalife, a strong brand in the Dehon Group, is delighted to be celebrating this exceptional anniversary, and would like to thank its customers and partners who have contributed to its success for 150 years.

Founded in 1874 in Belgium under the name Etablissements Joseph Peintre, the company's business began with refrigerants. It was with the visionary spirit of the Dehon family and to meet our customers' post-war challenges that, in the 1920s, Osée Dehon took over and ran the company. Constantly striving to go the extra mile, the group consolidated its position as a key player in the refrigeration industry and expanded by opening subsidiaries in Europe and abroad. Thanks to its expertise in process fluids and its desire to innovate, the range was extended with the launch of propellants and then polyurethane foams.

In the 1990s, the Dehon Group continued its global expansion and diversified its strategic activities in the refrigeration, fine chemicals, automotive and high-tech sectors, promoting progress and sustainability.

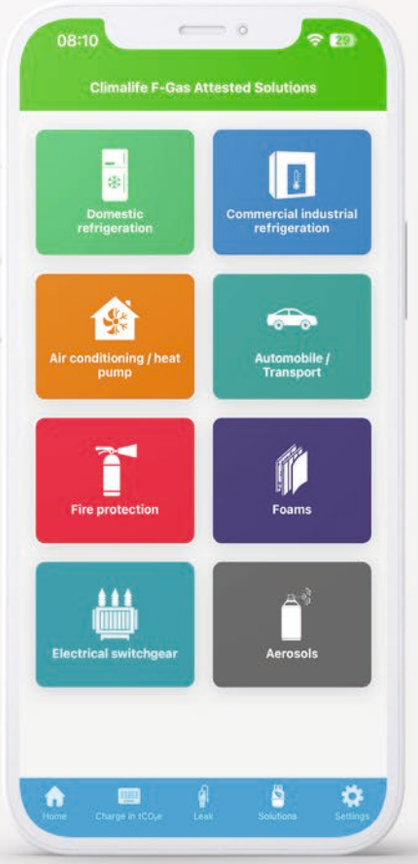
This year, we pay tribute to the Dehon family's legacy of resilience, foresight and entrepreneurship, and are proud to celebrate 150 years of innovation and audacity.

F-Gas Solutions

New regulations, new look, **discover the 2024 version!**

In 2014, Climalife launched F-Gas Solutions, the simple and educational mobile application that has become the benchmark in Europe for more than 90,000 refrigeration, air conditioning and heating professionals. **To comply with the new European regulation (EU) 2024/573, known as "F-Gas III"** which came into force on **11 March 2024,** F-Gas Solutions has undergone a complete overhaul and now includes all business applications using fluorinated greenhouse gases. The app supports Climalife customers, whatever their activity.

More comprehensive, better designed and more intuitive. Don't wait any longer - **download the new version of F-Gas Solutions!**



Directly accessible offline

Integration of aerosol, foam, fire protection and electrical switch applications.

Free

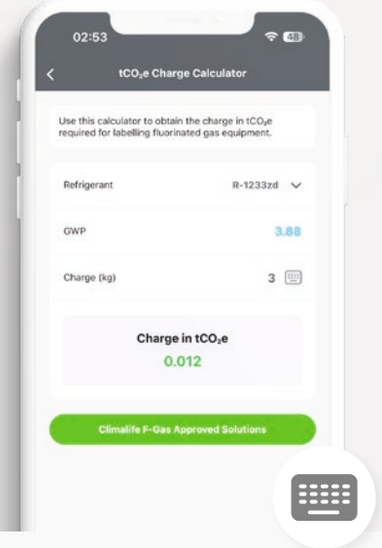
Available in
English | French | Dutch | Italian | Spanish | German | Hungarian.

F-Gas climalife

If you already have the application, it will be updated automatically.
***+ More than 90,000 users** trust us, **download the application** now on!*

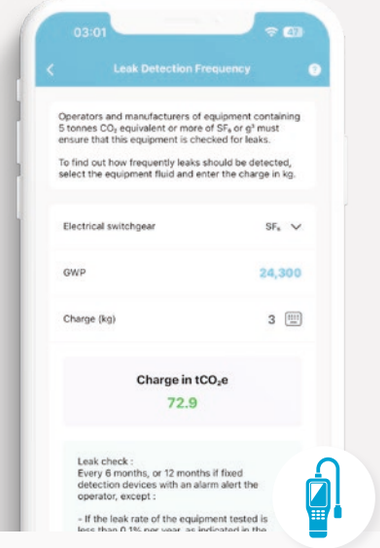
Download on the App Store

GET IN ON Google Play



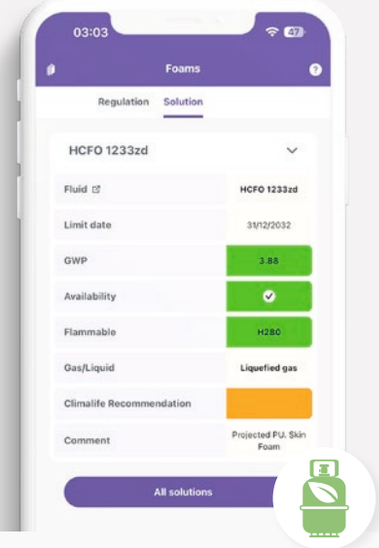
Charge calculator in t CO_2 EQ.

Obtain the GWP of an equipment's process fluid and its charge in Tonnes of CO_2.



Leak detection frequency

Determine the frequency according to the fluid and its charge in the system.



F-Gas certified Climalife solutions

Find the right solution for your needs, depending on the application and the equipment selected, whether new or existing.

Refrigerant replacement for

R-404A, R-448A, R-449A, R-452A, R-407F...

Choose Solstice® L40X, the long-lasting high-performance solution, F-Gas III approved

- **For new installations:** refrigeration units, condensing units, chillers, self-contained, monobloc etc.
- **Easy to install** Solstice® L40X and can be deployed by all engineers.
- **The highest permissible charge** per circuit thanks to its physical properties.
- **Manufacturer-approved components** and equipment.
- **With a GWP of 146,** a long-term, eco-efficient solution.

Medium & low temperature cooling

- Supermarkets
- Local shops
- Cold rooms
- Cold stores
- Food industry
- Laboratories and more

Honeywell

AUTHORIZED DISTRIBUTOR

climalife.com

FIND US ON: @climalife

climalife®