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Regulation (UE) 2024 / 573 “F-Gas”

Vade-mecum Operators / Owners

FEBRUARY 2024

IN A NUTSHELL

The original regulation on fluorinated gases, known as «F-Gas», was published in 2006 and revised in 2014. **The new European regulation 2024/573 was published in the Official Journal of the European Union on 20 February 2024 and applies from 11 March 2024.** This new revision of the F-Gas Regulation replaces and repeals Regulation (EU) No 517/2014/ and is the second revision of the F-Gas Regulation.

The gases covered and listed by this regulation are fluorinated greenhouse gases, including HFCs, HFOs and HFO/HFC blends.

This new regulation strengthens the existing arrangements related to:

- **Training and certification of operators and technicians,**
- **Containment and leak testing,**
- **The extension of certain provisions to mobile applications,**
- **Prohibiting the marketing of equipment,**
- **The use of certain fluorinated refrigerants,**
- **The phasing-down of HFC refrigerant marketing,**
- **Recovery and reprocessing,**
- **Combating trafficking in illegal fluids,**
- **Import and export control on products and equipment.**

This regulation has been extended to other sectors using fluorinated gases, such as the medical sector, insulating foams, electrical switches, etc. This document focuses solely on the provisions specific to the refrigeration, air conditioning and heat pump sector.

The Commission is preparing various implementing acts that will come into force in 2025, including the reporting format, minimum training and certification requirements, labelling, etc.

This is a European regulation, so it applies *de facto* without the need for transposition into national law. Our French Environmental Code (articles R-543-75 to R-453-123) will nevertheless have to be checked and adapted.

This document is a non-exhaustive summary from AFCE of the regulation 2024/573 mentioning only the main points regarding Operators and Equipment Holders. AFCE will communicate in more detail on certain points later and on the implementing acts, the delegated acts and some clarifications expected from the European Commission.

1. TRAINING AND CERTIFICATION OF OPERATORS AND TECHNICIANS

- Certification required for companies and technicians.
- Need for training and certification on alternatives to HFCs, including so-called «natural» fluids, and on measures to improve or maintain energy efficiency.
- Current attestations of competence remain valid but must be updated no later than 5 years after the new regulations come into force, i.e. before 12 March 2029.
- The new attestation of competence is valid for seven years and will therefore be subject to regular updating.
- The framework and the requirements for the training and certification programmes will be given to the Member States by the Commission during 2024/2025. The Member States will then have to notify their national provisions within one year (2026).

A standardised regulatory reference framework of skills in Europe would be an important objective to set an appropriate and homogeneous level of skills within the European Union. This work is underway with the European Commission and professional associations.

2. LABELLING

- The labelling requirement has been extended from HFCs and their mixtures to all fluorinated greenhouse gases listed in Annexes I, II and III of the Regulation, and therefore to systems operating with HFOs, which will also have to be labelled from 2025.
- The GWP values from the IPCC Fourth Assessment Report (AR4) will still be used for pure HFCs. On the other hand, HFOs and non-fluorinated gases will follow the GWP values of the Sixth Assessment Report (AR6).
- This means that a specific GWP calculation must be carried out in the case of HFC/HFO mixtures, for example, and that relabelling will be necessary in certain cases.

Example: R-454C (21.5% R-32 + 78.5% R-1234yf), which has an AR4 GWP of 148, has a specific GWP of 145.5 under the new F-Gas regulation.

	Composition			PRP/GWP			
	R-32	R-1234yf	R-744	R-32 AR4	R-1234yf AR6	R-744	New F-GAS
R-454B	68,90%	31,10%		675	0,501		465,23
R-454C	21,50%	78,50%		675	0,501		145,52
R-455A	21,50%	75,50%	3%	675	0,501	1	145,53

	R-1234ze(E)	R-227ea	R-1336mzz(E)	R-1234ze€ AR6	R-227ea AR4	R-1336mzz€ AR6	New F-GAS
R-471A	78,70%	4,30%	17%	1,37	3220	17,9	142,58

	R-1234yf	R-134a	R-152a	R-1234yf AR6	R-134a AR4	R-152a AR4	New F-GAS
R-516A	77,50%	8,50%	14%	0,501	1430	124	139,30

3. CONTAINMENT & LEAK TESTING

- Leak checks have been extended to include fluorinated gases, particularly HFOs.
- Any intentional release of fluorinated of fluorinated fluids is obviously prohibited, and operators and owners must take all measures to:
 - > Prevent leaks,
 - > Repair immediately and check after repair,
 - > Carry out periodic leak test, the frequency of which depends on the load, expressed in tonnes of CO₂ equivalent for HFCs and in kg for HFOs.
- No leak test required for hermetically sealed equipment in residential buildings if load < 3 kg of fluorinated greenhouse gases.

Refrigerant category	Refrigerant charge of equipment	Frequency of controls	
		Without detection system	With detection system
HFCs, PFCs Annex I ex: R-32, R-134a, R-410A, R-454C, R-471A,...	5 t.eq.CO ₂ ≤ charge <50t.eq.CO ₂	12 months	24 months
	50 t.eq.CO ₂ ≤ charge <500t.eq.CO ₂	6 months	12 months
	500 t.eq.CO ₂ ≤ charge *	(3 months)	6 months
Fluorinated gases Annex II section 1 ex: HFOs R-1234ze, R-1234yf, R-1233zd(E),...	1 kg ≤ charge <10 kg	12 months	24 months
	10 kg ≤ charge <100 kg	6 months	12 months
	100 kg ≤ charge *	(3 months)	6 months

* Leak detection system with mandatory warning and checked every 12 months

Hermetically sealed equipment, identified as such, is exempt from leak testing if :

HFCs, PFCs - Annex I	charge < 10 t.eq.CO ₂
Fluorinated gases Annex II section 1	charge < 2 kg

- After a leak has been repaired, equipment tightness must be checked again at the earliest after 24 hours of operation and at the latest one month after the repair (except for mobile equipment where tightness tests can be carried out immediately).
- As a reminder, the operator must keep a record of all work carried out, including fluid movements.
- The new provisions for leak tests come into force immediately.

4. EXTENSION TO MOBILE EQUIPMENT

- The above-mentioned leak tests are also mandatory for:
 - a) Refrigeration units on refrigerated trucks and refrigerated trailers.
 - b) Refrigeration units in refrigerated light commercial vehicles, intermodal containers, including refrigerated containers, and refrigerated wagons.
 - c) Air conditioning equipment and heat pumps for heavy commercial vehicles, vans, non-road mobile machinery used in agriculture, mining and construction, trains, metros, trams, and aircraft.

Les définitions des véhicules mentionnées ci-dessus sont précisées au chapitre 3 du règlement.

- Leak testing does **not** apply to point c) if the equipment is subject to a regular inspection regime including leak testing.
- A certificate of competence for technicians is compulsory to carry out leak tests for points a) and b)
- A training certificate is necessary and sufficient to carry out leak tests for point c).
- The obligation for points b) and c) will come into force on 12 March 2027.

5. RESTRICTION ON PLACING ON THE MARKET AND SALE

- Restrictions on placing on the market and sale of the products and equipment listed below, with the exception of military equipment, is prohibited from the dates indicated.
- Repair and maintenance of the existing equipment listed is authorised provided that:
 - > They do not result in an increase in capacity,
 - > There is no increase in refrigerant charge,
 - > The fluid used is not replaced by one with a higher GWP.

TO BE CONFIRMED:

The capacity levels mentioned refer to the Ecodesign Directive or, if not applicable, to the manufacturer's capacity declaration.

ÉQUIPEMENTS DE RÉFRIGÉRATION FIXES

APPLICATION	BAN THRESHOLDS	BAN DATE	SPECIAL CONDITIONS
Commercial refrigerators and freezers (stand-alone equipment).	PRP ≥ 150 (HFCs)	01/01/2022	
	PRP ≥ 150 (other fluorinated greenhouse gases)	01/01/2025	
Stand-alone refrigeration equipment, except chillers.	PRP ≥ 150	01/01/2025**	** Except where necessary to meet safety requirements at the operating site
Refrigeration equipment, except chillers and the types of equipment mentioned above	PRP ≥ 2500 (HFCs)	01/01/2020 *	* except for applications <-50°C
	PRP ≥ 2500 (other fluorinated greenhouse gases)	01/01/2025 *	
	PRP ≥ 150	01/01/2030 **	** Except where necessary to meet safety requirements at the operating site.
Commercial multi-station centralised refrigeration equipment using HFCs with a GWP > 150 and a capacity ≥ 40kW (except cascade centralised refrigeration primary circuits with a GWP < 1500)		01/01/2022	

Fluorinated greenhouse gases (GHG) = HCFCs, HFCs, HFOs, PFCs, HFEs

STATIONARY CHILLERS

APPLICATION	BAN THRESHOLDS	BAN DATE	SPECIAL CONDITIONS
Chillers			* except for applications <-50°C
	GWP ≥ 2500 (HFC)	01/01/2020 *	
	capacity ≤ 12kW GWP ≥ 150	01/01/2027 **	** Except where necessary to meet safety requirements at the operating site.
	capacity ≤ 12kW Ban on the use of fluorinated greenhouse gases ***	01/01/2032 **	
	capacity > 12kW GWP ≥ 750	01/01/2027 **	
			*** subject to review in 2030

Definition of the regulation

«chiller»: a self-contained system whose main function is to cool a heat-transfer fluid (such as water, glycol, brine or CO₂) for refrigeration, processing, preservation or comfort purposes.

STATIONARY AIR CONDITIONING EQUIPMENT & HEAT PUMPS

APPLICATION	BAN THRESHOLDS	BAN DATE	SPECIAL CONDITIONS
Stand-alone air-conditioning equipment and heat pumps, except chillers.			** GWP ≤ 750 where necessary to meet safety requirements at the operating site *** subject to review in 2030
	Mobile equipment GWP ≥ 150 (HFC)	01/01/2020	
	capacity ≤ 12kW GWP ≥ 150	01/01/2027 **	
	capacity ≤ 12kW Ban on the use of fluorinated greenhouse gases ***	01/01/2032 **	
	12kW < capacity ≤ 50kW GWP ≥ 150	01/01/2027 **	
	capacity > 50kW GWP ≥ 150	01/01/2030 **	
Mono- and multi-split air conditioning equipment and heat pumps			** Except where necessary to meet safety requirements at the operating site. *** subject to review in 2030
	charge < 3kg GWP ≥ 750 (HFC)	01/01/2025	
	Air/water - capacity ≤ 12kW GWP ≥ 150	01/01/2027 **	
	Air/Air - capacity ≤ 12kW GWP ≥ 150	01/01/2029 **	
	capacity ≤ 12kW Ban on the use of fluorinated greenhouse gases ***	01/01/2035	
	capacity > 12kW GWP ≥ 750	01/01/2029	
	capacity > 12kW GWP ≥ 150	01/01/2033	

Definition of the regulation

«Safety requirements»: requirements relating to the safe use of fluorinated greenhouse gases and natural refrigerants or products and equipment containing or relying on them, prohibiting the use of certain fluorinated greenhouse gases or their alternatives, including when contained in a product or equipment, at a specific location in the place where they are to be used due to site and application specificities that are defined:

- in EU or national law; or
- in a non-legally binding act setting out the technical documentation or standards to be applied to ensure safety at that specific location, provided that they comply with applicable EU or national law.

This point needs to be clarified. This work is in progress with the European Commission and professional associations.

6. RESTRICTION OF USE OF CERTAIN REFRIGERANTS

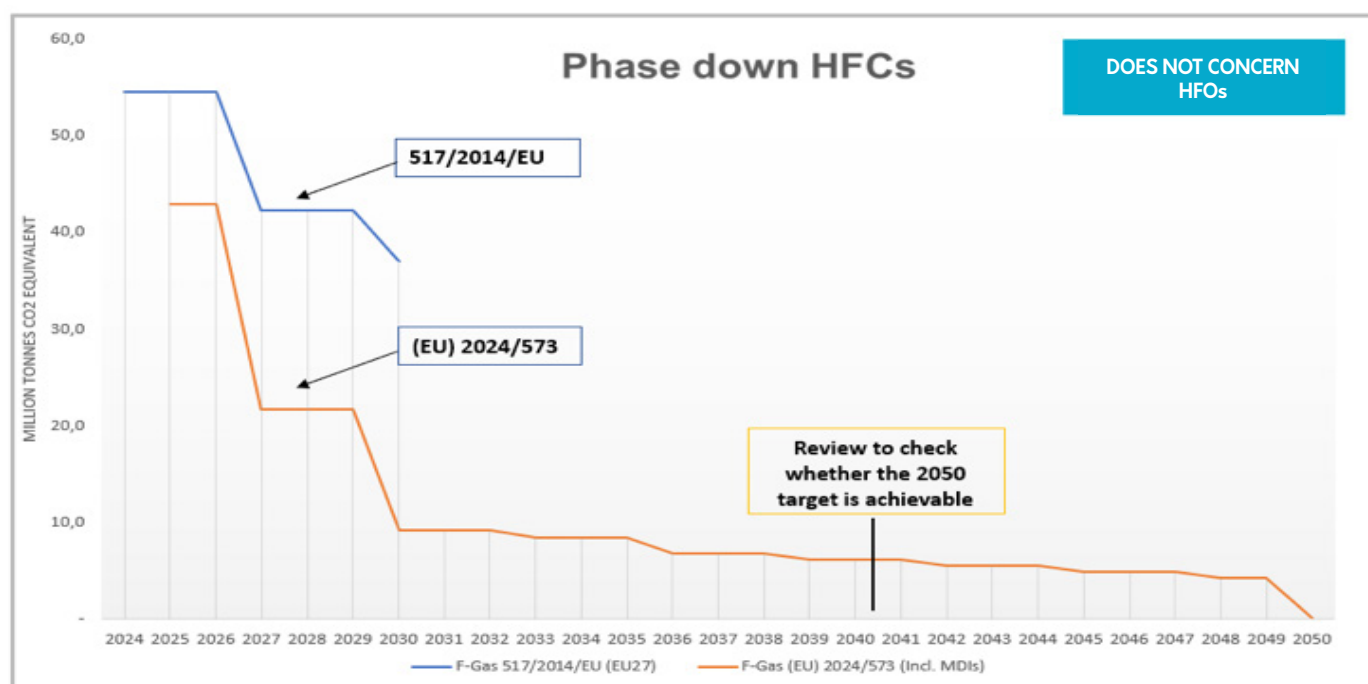
- The ban on the use of virgin refrigerants for maintenance, based on GWP and application has been reinforced and extended.
- From January 1, 2030, regenerated or recycled fluids with GWP ≥ 2500 for refrigeration will be banned.
- There is no restriction date for regenerated refrigerants with GWP < 2500 (e.g.: R-448A, R-449A)

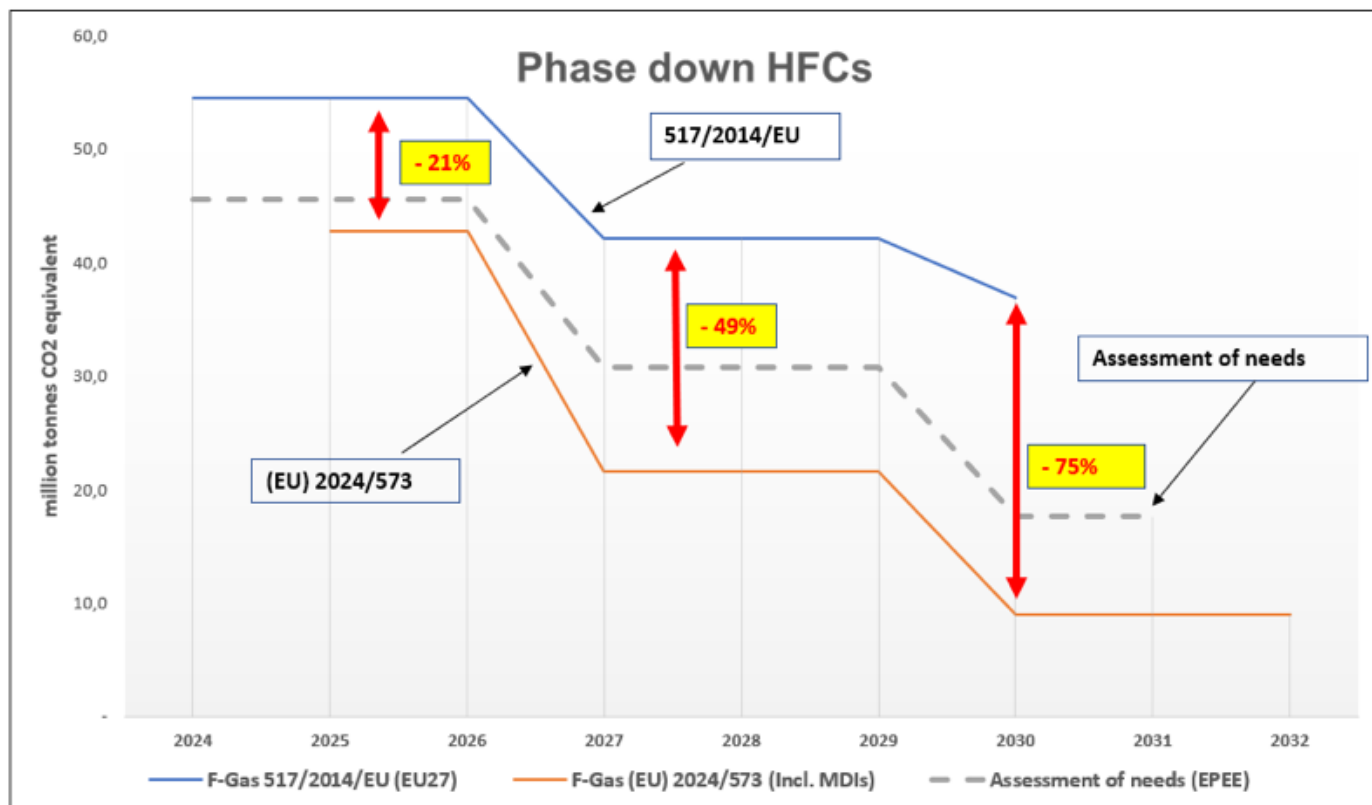
Refrigeration	Ban date	Comments
The use of fluorinated greenhouse gases, with a GWP ≥ 2500 for the maintenance of refrigeration equipment with a charge ≥ 40 t.eq.CO ₂ is prohibited, except regenerated or recycled fluid .	1 January 2020	
The use of fluorinated greenhouse gases with a GWP ≥ 2500 for the maintenance of all refrigeration equipment is prohibited, except for regenerated or recycled fluids, until 1 January 2030 .	1 January 2025	Does not apply to military equipment or equipment for applications designed to cool products to temperatures below -50°C.
The use of fluorinated greenhouse gases with a GWP ≥ 750 for the maintenance of fixed refrigeration equipment (except chillers) is prohibited, except for regenerated or recycled fluids .	1 January 2032	Does not apply to military equipment or equipment intended for applications designed to cool products to temperatures below -50°C or equipment intended for applications designed to cool nuclear power plants .

Air conditioning and heat pumps	Ban date	Comments
The use of fluorinated greenhouse gases with a GWP ≥ 2500 for the maintenance of air conditioning and heat pump equipment is prohibited, except for regenerated or recycled fluids, until 1 January 2032 .	1 January 2026	

7. PHASING DOWN HFC REFRIGERANTS

- As a reminder, HFCs may only be placed on the market if producers and importers have been allocated quotas by the Commission.
- Quota allocation is subject to a payment equal to **three euros for each tonne of CO₂ equivalent of quota to be allocated**.
- A new schedule of quotas for the marketing of HFC fluids from 2025 has been drawn up, with a new baseline and a target of zero HFCs by 2050.
- This does not apply to pure HFOs (e.g. R-1234yf, R-1234ze(E), R-1233zd).
- Allocated quotas now include the medical inhalers (MDI) market, which accounted for around 10 Mt CO₂eq in





- At least once a year, the Commission must analyse the impact of phase-down on the price of fluids, the development of alternatives and the deployment of heat pumps (RePowerEU).
- If the growth of heat pumps is hampered by a lack of allowances, **an additional allowance may be granted, up to 4.4 Mt CO₂eq in 2025-26 and up to 1.4 Mt CO₂eq in 2027-29.**

Serious risk of unavailability of fluids for the maintenance of the installed capacity. For the record, 88% of refrigerants used in refrigeration, air conditioning and heat pump systems in France are HFCs (AFCE/CITEPA 2023 study).

8. RECOVERY & REPROCESSING

- The owner of equipment containing refrigerants remains responsible for the recovery of these fluids by certified personnel.
- The operator is required to recover all fluorinated fluids, including HFOs.
- Recovered fluorinated fluids must not be used to charge or recharge equipment, unless they have been recycled or reclaimed.
- Recovery packaging must be made available by distributors.

Given that HFC fluids may become increasingly scarce as a result of phase down, particular attention must be paid to recovery whenever these fluids are handled. If in doubt, the recovered fluids must be returned to your distributor for analysis, reclaim or destruction.

9. REVIEW AND ANALYSIS SCHEDULE

- The new regulation incorporates **several important analyses and/or review stages, including the obligation for the European Commission to publish a report on the effects of this regulation by 1 January 2030.** Proof will have to be provided that alternative solutions are suitable, more energy-efficient, practical, reliable, sufficiently available, and economically viable in the applications for which a ban is proposed.

TIMETABLE

2027

**By 1 July 2027
at the latest**

The Commission publishes a report assessing whether there are cost-effective, technically feasible, energy-efficient and reliable alternatives, which make possible the replacement of fluorinated greenhouse gases in mobile refrigeration and air-conditioning equipment and, if appropriate, presents a legislative proposal for the European Parliament and the Council to amend the list in Annex IV.

**OBJECTIVE:
TRANSPORTATION**

2028

**By 1 July 2028
at the latest**

The Commission will publish a report assessing the impact of this Regulation on the health sector, in particular the availability of metered dose inhalers, as well as the impact on the market of cooling equipment used jointly with batteries.

OBJECTIVE: MDIs

2030

**By 1 July 2030
at the latest**

The Commission publishes a report on the impact of the regulation, including an analysis of:

- Solutions enabling the replacement of fluorinated greenhouse gases in Annex IV equipment, including split air conditioners and heat pumps;
- International developments in the maritime transport sector and the potential extension of the scope of the containment requirements to F-gases contained in refrigeration and air-conditioning equipment on ships;
- The potential extension of the scope of the export ban;
- The Commission shall, if appropriate, submit a legislative proposal to the European Parliament and the Council, which may include an amendment to Annex IV.

**VIABILITY OF ALTERNATIVES,
VERIFICATION OF OBJECTIVES, + BANS**

2040

**By 1 July 2040
at the latest**

The Commission shall review the need for hydrofluorocarbons in sectors where they are still used and the phasing out of the HFC quotas set out in Annex VII for the year 2050, taking into account in particular technological developments, the availability of alternatives to hydrofluorocarbons for the applications concerned and the Union's climate objectives.

Where appropriate, the review is accompanied by a legislative proposal to the European Parliament and the Council.

**OBJECTIVE:
NET ZERO BY 2050**



Created in 1995, AFCE, Alliance Froid Climatisation Environnement encompasses industry representatives, collective members, and users, representing, from the producer to the end user, the French sector of Refrigeration, Air Conditioning and Heat Pump. Together we encourage and support a voluntarist, responsible, coordinated, and coherent application of the F-Gas Regulation, the European Green Deal, and the Framework Convention on Climate Change. The members of the association are specialists, all from the refrigeration and air conditioning sector for the most exhaustive representativeness. They work together, pooling their technical and organizational skills to determine the means and methods necessary for the development of the sector, for the well-being of all, while respecting the global and human environment.

Source : <https://www.afce.asso.fr>

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