The EU F-gas Regulation Revision

What does it mean for your business?

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Refrigerants are an integral part of heat pump and air conditioning technology. Like our systems and products, refrigerants have also continually evolved to adapt to new requirements for efficiency and, above all, environmental protection.

This leaflet aims to give you an **insight in Daikin's refrigerant strategy** for the European market and more background on the **F-gas Regulation** so you can confidently prepare for the future.

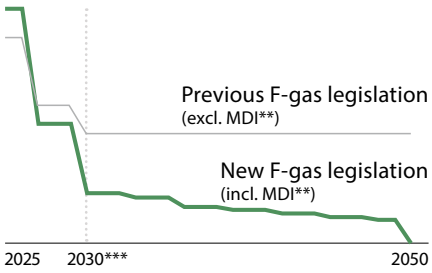
What is the EU F-gas Regulation (EU) 2024/573?

The Regulation (EU) 2024/573 on fluorinated greenhouse gases* is a set of rules within the European Union designed to control and reduce the consumption of hydrofluorocarbons (HFCs) in Europe. The regulation encourages using more sustainable alternatives, such as lower global warming potential (GWP) refrigerants and re-use practices, to mitigate climate change. The latest revision came into force on 11 March 2024.

Key elements of the 2024 EU F-gas Revision

- A stricter phase-down path from 2025 onwards and a phase-out of virgin HFCs by 2050***
- Stricter GWP limits for specific types of products (see page 5), with post-2030 limits subject to possible review
- Products placed on the market before a GWP limit comes into force can continue to be sold, installed, operated and serviced throughout their entire lifetime (see page 6)
- Exemptions can be applied to the introduced product bans when compliance is not feasible due to safety requirements, lifecycle climate performance (LCCP), or other justified reasons (see page 3)

Stricter F-gas Regulation phase down
(tonnes CO_2 equivalent)



Find **more information** and access to our **frequently asked questions** on our F-gas web page!

* REGULATION (EU) 2024/573 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 February 2024 on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014

** Scope has changed, the MDI (metered dose inhalers) sector is now also in scope of the HFC phase down

*** Post 2030 limits subject to possible review

F-gas Regulation – a phased approach

While introducing GWP limits, the EU clearly indicates that different applications move at different speeds of transition.

Smaller self-contained and split systems, as well as chillers, are the first ones to move below the 150 GWP limit, from 2027 onwards. For larger systems the change is expected later towards 2030 or beyond.

Review date
In 2030, there will be an evaluation by the EU Commission to determine whether the post-2030 product bans are appropriate. Depending on this report, amendments are still possible to bans taking effect after 2030.

			2024	2025	2026	2027	2028	2029	2030
Split AC & HPs	Splits AC & HPs ≤ 12 kW	Air-to-air splits	No GWP limit	No GWP limit (except single split < 3 kg: GWP 750*)					GWP 150**
		Air-to-water splits	No GWP limit	No GWP limit (except single split < 3 kg: GWP 750*)		GWP 150**			
	Splits AC & HPs > 12 kW	Air-to-air & air-to-water splits	No GWP limit	No GWP limit (except single split < 3 kg: GWP 750*)					GWP 750**
Self-contained AC & HPs, and chillers	Self-contained AC & HPs	≤ 12 kW	No GWP limit			GWP 150**			
		> 12 kW ≤ 50 kW	No GWP limit			GWP 150**			
		> 50 kW	No GWP limit						GWP 150**
	Chillers (cooling only)	≤ 12 kW	GWP 2,500** for HFCs (except equipment for temperature < –50 °C)			GWP 150**			
		> 12 kW	GWP 2,500** for HFCs (except equipment for temperature < –50 °C)			GWP 750**			
Refrigeration		Refrigerators/freezers for commercial use (self-contained)	GWP 150 for HFCs	GWP 150**					
		Other self-contained refrigeration equipment		GWP 150**					
		Multi pack centralised system for commercial use > 40 kW	GWP 150** (except primary refrigerant circuit of cascade systems: GWP 1,500)						
		All other stationary refrigeration equipment	GWP 2,500 for HFCs	GWP 2,500** (except equipment temperature < –50 °C)					GWP 150**
		Mobile refrigeration	No prohibition for placing on the market of mobile refrigeration						

* Existing ban from 2014 F-gas regulation applicable to both air-to-air and air-to-water single splits. Above 3 kg refrigerant: no GWP limit

**** Exemptions to the 2024 F-gas Regulation product bans**
While the 2024 F-gas Regulation introduces strict product bans, several exemptions apply under specific conditions:

- **Safety exemption[1]:** If safety requirements at the installation site prevent the use of equipment with low-GWP F-gases or alternatives, the ban does not apply; labelling required (applicable to newly introduced bans only).
- **LCCP exemption[2]:** Equipment with lower total lifecycle CO_2 equivalent emissions than equivalent equipment with compliant alternatives can be exempted.
- **Exemption upon request[3]:** A temporary (up to 4 years) exemption may be granted by the commission if alternatives are unavailable, unsafe, or would cause disproportionate costs. This exemption can be requested for the product bans as well as for the HFC phase down.

In all cases the HFC phase down still applies. For equipment that is banned in the EU, an export ban applies if the GWP is 1,000 or more. Exemptions to the export ban can also be requested.

View the **complete overview on product bans** on our F-gas web page!

(1) See F-Gas Regulation, Art. 3 (42) and Annex IV (2) See F-Gas Regulation, Art. 11.2 (3) See F-Gas Regulation, Art. 11.5 and Art. 16.4

Our refrigerant strategy: a balanced refrigerant choice per application

There is no one-size-fits-all refrigerant, as different applications present different challenges.

Daikin's strategy is to choose the ideal refrigerant for each application by balancing safety, energy efficiency, environmental impact and cost over the entire life cycle of a product.

Environmental impact

- Lower refrigerant GWP
- Potential to be recycled and reused
- Lower lifecycle climate performance (LCCP) of equipment

Safety

- Considering the whole life cycle, including transport, storage, installation, use, servicing, recovery & recycling
- Evaluating for each type of use, taking into account toxicity and/or flammability

Energy efficiency

- Reducing energy consumption to lower the indirect CO_2 impact
- Reduced running costs for end-users

Cost-effectiveness

- Provide customers with affordable solutions
- Regarding equipment, installation, operation, maintenance and end-of-life treatment

Refrigerant outlook for Europe

In order to meet a wide range of safety and performance requirements and to continue to drive the decarbonisation of the building sector, different refrigerants (fluorinated and non-fluorinated) are needed. In the table below you can find our most important future refrigerants for Europe.

Examples of refrigerant options for comfort applications

Refrigerant	R-32	R-290	R-454C	R-744 (CO_2)
GWP	675	0.02*	145.5*	1
Energy efficiency	+++	+++	+++	++
Safety	⚠ ▪ Lower flammable (A2L) ▪ Refrigerant and hydrosplit connection possible ▪ Suitable in most applications	⚠⚠⚠ ▪ Highly flammable (A3), VOC ▪ Limitations based on refrigerant amount ▪ Suitable only in special applications	⚠ ▪ Lower flammable (A2L) ▪ Refrigerant and hydrosplit connection possible	⚠ ▪ Not flammable (A1) ▪ Suitable in most applications ▪ High pressure
Affordability	€	€€ ▪ Additional safety precautions ▪ Bigger dimensions to keep efficiency	€€ ▪ More materials required ▪ Bigger dimensions to keep efficiency	€€ ▪ More materials required ▪ Bigger dimensions to keep efficiency

* GWP values in accordance with revised F-gas Regulation (EU 2024/573)

Daikin takes care of the products

The F-gas Regulation has raised questions for many, like "What do I need to pay attention to?" and "How do I ensure that the products can be installed?"

At Daikin, we handle these concerns by ensuring that **every product we offer fully complies with the F-gas Regulation. This means that the products we offer you can be sold, operated, maintained and repaired till the end of their lifetime, without any worries**.

Below you can find an overview of refrigerants available from, or being investigated by Daikin, per product group. We are constantly looking for alternative refrigerants to reduce our carbon impact, always ensuring the safety for the whole lifecycle of the product. In case of new information this list will be updated.

Our refrigerant alternatives for the European market

	Daikin product group		Refrigerant options*
Air to air	Split	Pair & multi	R-32 GWP: 675 R-290** GWP: 0.02 Other low GWP refrigerants under investigation
	Sky Air	Pair, twin, triple, double twin	R-32 GWP: 675 R-290** GWP: 0.02 R-744** GWP: 1 Other low GWP refrigerants under investigation
	VRV		R-410A GWP: 2,087.5 R-32 GWP: 675 R-744 GWP: 1
Air to water / water to water	Daikin Altherma (residential)		R-32 GWP: 675 R-290 GWP: 0.02 Other low GWP refrigerants under investigation
	Applied heat pumps and cooling only (chillers)		R-410A GWP: 2,087.5 R-134a GWP: 1,430 R-32 GWP: 675 R-513A GWP: 629.5 R-454C GWP: 145.5 R-1234ze GWP: 1.37 R-290 GWP: 0.02 R-717 GWP: 0
Cold chain refrigeration	Plug-in refrigerated showcase cabinets	Plug-in	R-290 GWP: 0.02
		Remote	R-744 GWP: 1
	Monoblocks (cold rooms)		R-290 GWP: 0.02
	Multi compressor packs and racks		R-744 GWP: 1
	Condensing units & other stationary equipment		R-452A GWP: 2,139.4 R-410A GWP: 2,087.5 R-134a GWP: 1,430 R-449A GWP: 1,396.2 R-448A GWP: 1,386 R-744 GWP: 1 R-717 GWP: 0 (large chillers) Low GWP refrigerants under investigation
	Transport refrigeration		R-452A GWP: 2,139.4 R-134a GWP: 1,430

For an overview of which specific models are available with which refrigerant, please consult our general catalogue or Daikin Europe website.

Find out more about **our outlook on refrigerants** in Europe here!

* GWP values in accordance with revised F-gas Regulation (EU 2024/573)

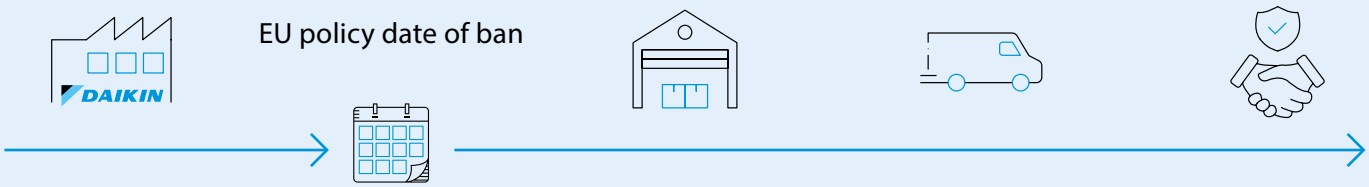
** Product range under investigation

Sales, maintenance and repair of products

A ban of certain refrigerants doesn't mean a complete ban on selling, installing and operating systems.

- All concerned **equipment already placed on the market** (in stock by Daikin, wholesalers or installers) prior to the start of a ban **can still be sold out**.
- If it is not possible to install a compliant system for **safety reasons** at the site of installation, the ban does not apply.
- Daikin **spare parts and technical support** are guaranteed for the lifetime of the systems. Parts of equipment (e.g., indoor units) can still be placed on the market after the ban dates if they are intended for repair or servicing of existing equipment, if it does not lead to an increase in capacity or charge.

You can still sell, operate, maintain and repair products after the ban



- Last placement on the EU market by Daikin Europe (exemptions are possible)

- The F-gas Regulation guarantees sales from local stock, even after the ban date!
- Daikin ensures continued supply of spare parts, refrigerant for repair/refill and after sales support until end of life.

Maintenance + Spare parts + Refrigerant + Sales support

Find out more details about **servicing & maintenance** of products here

Leak checks

Leak checks are an important part of the revised F-gas Regulation and are essential when handling refrigerants. Below you can find the latest information and guidance.

General guidelines

NEW **In addition to the known limits for HFC refrigerants for carrying out leak checks, leak checks must now be carried out for filling quantities of 1 kg HFO refrigerant or more (2 kg for hermetically sealed systems).**

NEW **From now on**, leak tests must be carried out on chillers with the **refrigerant R-1234ze with a filling quantity of ≥ 1 kg**. The specialist company carrying out the inspection must also have a F-gas certification.

Exception: For hermetically sealed equipment installed in residential buildings, no leak checks need to be carried out if the filling quantity is < 3 kg.

Type of refrigerant	Refrigerant charge	Prescribed frequency of leak checks	
		Without leak detection system	With leak detection system
HFC	< 5 tCO_2eq	No check needed	No check needed
	≥ 5 tCO_2eq (hermetically sealed equipment: ≥ 10 tCO_2eq), < 50 tCO_2eq	**Every 12 months**	**Every 24 months**
	≥ 50 tCO_2eq, < 500 tCO_2eq	**Every 6 months**	**Every 12 months**
	≥ 500 tCO_2eq	Not allowed*	**Every 6 months**
HFO	< 1 kg	No check needed	No check needed
	≥ 1 kg (hermetically sealed equipment: ≥ 2 kg), < 10 kg	**Every 12 months**	**Every 24 months**
	≥ 10 kg, < 100 kg	**Every 6 months**	**Every 12 months**
	≥ 100 kg	Not allowed*	**Every 6 months**

* Leak detection system required for refrigeration, air conditioning and heat pumps

! The revised F-gas Regulation requires checking each component of an **HFC/HFO blend** individually. Whichever leak check requirement is reached first defines the requirement.

Example for R-454C (GWP: 145.5)

- Composition: R-32 (21.5%) + R-1234yf (78.5%)
- HFC: leak check needed from 5 tonnes CO_2eq onwards – 7.4 kg of R-32 = **34.4 kg of R-454C**
- HFO: leak check needed from 1 kg onwards – 1 kg of R-1234yf = **1.3 kg of R-454C**

➔ HFO threshold is reached first
➔ Leak check needed from 1.3 kg onwards

After repair

As before, the final leak test after a repaired leak must be carried out **within one month of the repair**.

NEW The **minimum time interval** between repair and the final leak test must now be **at least 24 hours** (previously the test could be carried out directly after the repair).

This regulation applies immediately to all systems, regardless of the type of refrigerant, after repairing a leak.

Training & certification

The EU F-gas Regulation expands the certification requirements for technicians to HFOs and non-fluorinated refrigerants. **A certificate will now also be needed if technicians (only) work with non-fluorinated refrigerants**, such as propane, CO_2 or ammonia.

Six certificate categories are introduced

NEW (EU) 2024-2215	Scope of refrigerants	Scope of activities			
		Leak checking	Installation	Repair, maintenance or servicing + decommissioning	Recovery
Certificate A1	F-gases (HFC + HFO)	●	●	●	●
	Hydrocarbons		●	●	
Certificate A2 < 3 kg (or 6 kg if hermetically sealed)	F-gases (HFC + HFO)	●	●	●	●
	Hydrocarbons		●	●	
Certificate B	CO_2		●	●	
Certificate C	Ammonia		●	●	
Certificate D < 3 kg (or 6 kg if hermetically sealed)	F-gases (HFC + HFO)				●
Certificate E	F-gases (HFC + HFO)	●			

If you are already certified under the old regulation, the deadline to get certified according to the new rules is 12th of March 2029. Recertification is required every 7 years.

Member states are required to incorporate these requirements into their national training and certification schemes.

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