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## Eurovent comments and data collection for the open consultation on the PFAS restriction proposal

### In a nutshell

Within this document, Eurovent provides comments and results of the data collection among its members to reply to the open consultation on the PFAS restriction proposal. The following paper has been jointly developed by the Eurovent task force 'FGAS', which groups all Eurovent members active in heating, air conditioning and refrigeration sectors, and the Eurovent Product Group 'Air Filters'. The latter part on air filters is completed by a separate appendix. Eurovent is also aligned with the Orgalim position paper dated 31 August 2023.<sup>1</sup>

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### Appendix

Paper on REACH PFAS restriction proposal for PFHxA (C6) containing air filters media

<sup>1</sup> [Orgalim position and recommendations on the proposed PFAS restriction](#), Brussels, 31 August 2023

## PFAS and the Heating, Air Conditioning and Refrigeration industry

### 1. Quantity, type and use (application) of PFAS substance or mixture used

#### PFAS as refrigerants

The PFAS restriction proposal potentially affects several refrigerants currently used by the industry, leaving out only non-fluorinated refrigerants and few other fluorinated refrigerants such as R32, R152a, R23 and some sector-specific refrigerants like R1132.

The main pure refrigerants currently used, included in the PFAS restriction report, are:

- R-125
- R-134a
- R-143a
- R-1224yd
- R-1233zd(E)
- R-1234yf
- R-1234ze(E)
- R-1336mzz(E)
- R-1336mzz(Z)

These refrigerants are part of many refrigerant blends that are widely used and would also be affected by the PFAS restrictions. Some examples are enumerated in the following:

- R-407C
- R-410A
- R-448A
- R-449A
- R-450A
- R-452A
- R-452B
- R-454A
- R-454B
- R-454C
- R-455A
- R-513A
- R-513B
- R-515B

The applications where the virgin refrigerants and their blends indicated above are used vary between Chillers (e.g. comfort or process heating and cooling, marine and reefer applications, ...), Heat Pumps (e.g. heating, cooling, sanitary hot water, ...), IT Cooling (e.g. data centre applications, ...), Air Handling Units (e.g. Industrial Ventilation technologies...), Rooftops, Refrigeration equipment (e.g. Food Cold Chain technologies ...) etc.

Some refrigerants that are not used anymore in new equipment due to F-Gas Regulation restrictions, like R404A and R507C, are currently used when reclaimed or recycled for the service and maintenance of existing appliances and systems.

### Degradation to TFA and considering TFA as PFAS according to the UNEP report on Environmental Effects of Stratospheric Ozone Depletion, UV Radiation, and Interactions with Climate Change

Eurovent would like to highlight a recently published report<sup>2</sup> of UNEP regarding TFAs, which is important to consider. Below is reported an extrapolation from the chapter 3.8 “*Conclusions and uncertainties*”; TFAs are assessed also within the *Executive summary - 6 Air quality and contaminants*, and the chapter 3.1.1 “*Classification of trifluoroacetic acid as a per- and poly-fluoroalkyl chemical*”.

“3.8 Conclusions and uncertainties (pag. 292 of the report)

*TFA is a perfluorinated acid that has been included in the class of per- and polyfluoroalkyl substances (PFAS). This class of chemicals contains 4730 substances, of which about 256 are in commercial use. [...] To regulate these substances as a class (as has been suggested) is not scientifically defensible and TFA should be treated as a unique chemical for the purposes of regulation. [...] This persistence is not a major concern because it does not react with biomolecules. TFA and its salts are easily excreted by animals and do not bioaccumulate in food chains. Salts of TFA have low toxicity to animals and plants and there are very wide margins between current/projected exposures and toxicity values. One source of TFA in the environment is the degradation of replacements for chemicals that contribute to the destruction of stratospheric O<sub>3</sub>. These are the HCFCs, HFCs, and HFOs, all of which are replacements for chemicals that fall under the purview of the Montreal Protocol. [...] These releases will add to the existing load of TFA in the environment but predicted amounts are well below the threshold for concern with respect to human and environmental health.”*

Considering what above, Eurovent would like to request a time-unlimited derogation for F-gases use in HVACR sector.

### PFAS used in components

PFAS are used in a significant number of components, subassemblies, spare parts used within the HVAC/R equipment, most of which do not have alternatives to date. All of the below-listed components are critical for the correct functioning of the units, also from an Ecodesign efficiency and safety point of view.

The following is a non-exhaustive list:

- Compressors
- Cabinet vent / filter
- Coax cables
- Coolant for liquid cooled servers
- Electrotechnical and Electronic components – diodes, capacitors, sensors, motors, switches, etc.
- Exterior cabinet paints and coatings
- Heat Exchanger tubes – hydrophilic coating (potential)
- High Temperature and/or chemically resistant O-rings / Seals / Gaskets
- Lithium-Ion Batteries – electrode substrate and in the electrolyte
- Plumber's tape (PTFE / Teflon)
- Printed Circuit Board Coatings (potential and likely)
- Pumps (using PFAS o-rings, seals, gaskets)

<sup>2</sup> Environmental Effects of Stratospheric Ozone Depletion, UV Radiation, and Interactions with Climate Change - March 2023: [EEAP-2022-Assessment-Report-May2023.pdf \(unep.org\)](https://www.unep.org/assessment-reports/EEAP-2022-Assessment-Report-May2023.pdf)

- Semiconductors
- Wire coatings, insulation, foams

### PFAS used in suppliers processes

Many of our suppliers also use PFAS in their processes. Examples include cleaning tools, degreasing stamped metal dies, plastic and rubber mould release agents, emulsifiers and electronic manufacturing atmosphere purges. These processes are carried out by specific and highly costly equipment that could require extensive adaptation, if not total replacement, in case that the use of PFAS is banned.

## 2. Containment measures currently in place or upcoming

Lifetime Emissions: Our industry follows and respects the current F-Gas Regulation and has implemented all the required measures to prevent emissions of F-gases from existing equipment by implementing checks, proper servicing and recovery of the gases at the end of the equipment's life.

The PFAS impurity limits indicated within the restriction proposal do not consider the procedures and processes for the manufacturing, supply chain, recovery and recycle processes and procedures of HFCs, HFOs and HCFOs. The analytical methods included in the restriction proposal are not relevant to the practical analysis of these F-gases and their impurity levels.

A number of F-gases are not, due to their chemical structure and properties, within the restriction proposal, for example, HFC-32 and HFC-152a (referred to below as "excluded F-gases"). However, they may contain very low concentrations of short chain PFAS (that is, other HFCs and HFOs that are contained within the proposal) and that may be formed during the manufacture of the excluded F-gases. Furthermore, it cannot be ruled out that excluded F-gases could become contaminated with low concentrations of short chain HFCs/HFOs/HCFOs in scope of the restriction, due to the fact that F-gas imposes the obligation of using refillable and returnable containers.

It is recommended that a specific concentration limit is established for fluorinated impurities threshold for the virgin and reclaimed excluded F-gases which, for consistency, should be based upon the AHRI 700 2019 Standard for Specifications for Refrigerants, with allowable fluorinated impurities in F-gases of up to a maximum of 5000 ppm, without any individual limits.

The appropriate treatment of the waste according to WEEE Directive can reduce and prevent disposal emissions. A proper management (collection, transport, depollution, treatment for reuse, environmentally sound treatment) of waste should be supported by a dedicated exemption in the restriction proposal, ensuring preparing for reuse and recycling companies addressing the end of life of the products contributing to the circular economy. Otherwise, a massive and illegal landfill of waste will occur.

PFAS substances contained in solid objects (see the PFAS used in components section above) are not subject to be released in the environment during the product lifetime. Furthermore, these products are properly treated at the end of their life under the WEEE Directive. Therefore, in reason of their negligible PFAS release factor and considering that the majority of the components, sub-assemblies and spare parts currently used by the industry do not have non-PFAS alternatives to-date, a dedicated exemption for this kind of applications ("solid components for the industry") should be foreseen. In particular spare parts need to be exempted during the whole lifetime. Following the EU Right to Repair principle and the material and resource efficiency requirements embedded in the Ecodesign

framework and the upcoming EU Sustainable Product design requirements a circular economy needs to be guaranteed avoiding artificial created obsolescence of appliances.

### **3. Currently adopted alternatives, and/or activities done to develop alternatives to PFAS substances**

In most air conditioning products and heat pumps applications the PFAS-impacted R-410A refrigerant can be replaced by R-32, R-454B or R-452B (the latter two also impacted by PFAS restriction proposal) whereas R-134a, R-513A, R-513B can partially be replaced by R-1234ze (also impacted by the PFAS restriction proposal) and R-152a. Natural refrigerants are still at an early stage of development for these applications.

A considerable share of the stationary refrigeration industry has already adapted its technologies and product portfolio to use natural refrigerants instead of HFCs or HFOs, universally guaranteeing a high level of efficiency.

Some national building codes may prohibit the use of toxic or flammable refrigerants, therefore completely abandoning synthetic refrigerants seems difficult.

### **4. Percentage of turnover linked to PFAS related substances**

Depending on the core business of the company, the turnover linked to PFAS related substances could vary from 5% for air handling units' and stationary refrigeration manufacturers to more than 70% of the turnover for the chillers, heat pumps, IT cooling and rooftops manufacturers.

### **5. Impact on the product availability in case of ban**

The impact of the potential restriction on PFAS is strictly linked to the new Regulation on F-Gases, still to be finalised.

Therefore, the fluorinated refrigerants are potentially impacted by both the F-GAS Regulation and the REACH, with possible mutual impacts.

As an industry we support new technologies, where the application allows it, which already use alternative non-PFAS fluorinated and non-fluorinated refrigerants (as it is already the case in many stationary refrigeration applications) and foam blowing agents in many applications. To secure future innovation (eventually with PFAS) paths it's recommended to integrate a review clause in the restriction proposal.

Since several years the stationary refrigeration industry has already adapted its technologies and product portfolio to use non-fluorinated and non-PFAS refrigerants, universally guaranteeing a high level of efficiency even in the warmest climatic regions of Europe and without compromising on safety.

Regarding the use of fluorinated refrigerants for servicing or maintenance and the refrigerant stock currently contained in existing systems, the most commonly used refrigerants in the existing HVAC&R equipment are PFAS.

A restriction on PFAS refrigerants could lead to premature obsolescence of equipment.

In the current proposal, a 13.5-year derogation is foreseen for maintenance activities, but this period of time is not sufficient to cover the entire lifetime of some equipment with a lifetime up to 25 or 30 years, particularly for domestic applications. As an industry we recommend integrating a time-unlimited derogation covering the complete lifetime of the appliances.

It must be highlighted though that some PFAS substances are used in some key components and lubricants as shown in the above chapters, widely adopted in the HVAC&R industry to manufacture products and systems, and that have no alternative to date.

For those components a time unlimited derogation for both fluoropolymers and non-fluoropolymers should be developed that also reflects the availability of spare parts for repair in the sense of Ecodesign (e.g. is not acceptable to scrap a compressor due to unavailability of an PFAS free o-ring with interchangeable design).

The PFAS substances are present in minimum amounts/percentages, confined within the molecular structure with no volatility or dispersion possible, and completely recovered when treating these components at the end of their life (as per WEEE Directive).

In any case and based on the above, it's also proven that the 18 months transition period is far too short. This sector has such a complexity that a least 5 years of derogations is recommended.

## **6.Expected socioeconomic impacts on the company/business/employment due to a PFAS ban**

As for the above point, the impacts are strictly linked to the final provisions of the regulation on F-Gases.

Considering the information given and the data at disposal of the manufacturers, it can be estimated that the potential impact of the PFAS proposal could have a huge effect on the market. It must be noted that, as highlighted in the previous chapters, not only refrigerants will be affected by the proposal but several components, spare parts and processes, and therefore the entire value chain could suffer from this.

On the other hand, it could be predicted that for some sectors that are already using natural refrigerants for their products and systems (as it is the case in the stationary refrigeration sector), a ban on PFAS refrigerants could accelerate the replacement of mature systems using PFAS HFCs, stimulating investments, creating green jobs and increasing employment in Europe, with workers needing to be retrained and upskilled.

Eurovent membership represent several global players with research & innovation centres and manufacturing sites in Europe but with major trade relationships in third countries. Due to the proposed "restriction on the use", they are also prohibited to export innovative and high energy efficient solutions to those third countries. As a consequence, part or complete manufacturing capacity, including employment, will be relocated outside EU. This is in complete contradiction with the European Green Deal Industrial Plan (e.g. NZIA...). In order to enhance global competitiveness of these global players, an exemption for the export of equipment to third Countries should be required.

## PFAS and the air filtration industry

A key feature of air filters widely used in HVAC applications, besides high filtration efficiency, is their energy efficiency reflected by average pressure drop over their service life.

Ensuring a low pressure drop, and thus reducing energy consumption to overcome the resistance of airflow through the filters, is essential to achieving global environmental goals.

A fundamental impact on the properties of filters, such as durable water repellency and high dust holding capacity, has C6 (PFHxA), which is an additive used in the manufacture of filter media.

Air filters operate in the wide range of ambient humidity and temperature related to weather conditions. This often results in condensation of moisture on the surface of filtration media. In many cases filters may be exposed to direct rain (when installed close to the outdoor air inlet). Without accurate water repellency, filtration media loses its properties which leads to water clogging air passages and loss of particle separation abilities. This in turn considerably deteriorates filtration efficiency and increases pressure drop (energy consumption).

No less important is the oil repellency. Filter manufacturers use adhesives (e.g., glue) to pleat the filtration media and assemble the filters. The adhesive bonds the pleated media into the filter frame and prevents liquid or air leakages. By providing oil-repellency, C6 ensures that the media is repellent to glue, preventing the adhesive from penetrating inside the media with the risk of clogging air passages, and ensuring shape stability of the filter. In absence of C6, there would be an increased risk of adhesive adsorption and increasing pressure drop properties, which would ultimately lead to a reduced lifetime and higher energy consumption. Oil-repellence is therefore a crucial feature for filter manufacturers.

The REACH PFAS restriction proposal covers the filtration and separation media used in high performance air and liquid applications in industrial or professional settings that require a combination of water and oil repellence, which include air filtration media containing PFHxA (C6). The currently proposed PFAS derogation, covering the PFHxA (C6) containing media air filters is 6.5 years.

Although the entirely equivalent alternatives of PFHxA (C6) containing filtration media do not exist on the market yet, Eurovent members believe that they will be available in the near future and support the proposed 6.5-year derogation. However, given the importance of the PFHxA (C6) impact on key properties of filtration media, Eurovent would like to emphasize that the proposed derogation period should not be shortened.

To substantiate the Eurovent position, we provide an overview of the HVAC filtration sector and information on the potential impact of too early restrictions on air filters with media containing PFHxA (C6) in the attached appendix.

In conclusion, Eurovent supports the proposed ban with a transition period of 18 months and a 5-year derogation for textiles for the use in filtration and separation media used in high performance air and liquid application in industrial or professional settings that require a combination of water and oil repellence.

## Eurovent and transparency

### When assessing position papers, are you aware whom you are dealing with?

Eurovent's structure rests upon democratic decision-making procedures between its members and their representatives. The more than 1.000 organisations within the Eurovent network count on us to represent their needs in a fair and transparent manner. Accordingly, we can answer policy makers' questions regarding our representativeness and decisions-making processes as follows:

#### 1. Who receives which number of votes?

At Eurovent, the number of votes is never determined by organisation sizes, country sizes, or membership fee levels. SMEs and large multinationals receive the same number of votes within our technical working groups: 2 votes if belonging to a national Member Association, 1 vote if not. In our General Assembly and Eurovent Commission ('steering committee'), our national Member Associations receive two votes per country.

#### 2. Who has the final decision-making power?

The Eurovent Commission acts as the association's 'steering committee'. It defines the overall association roadmap, makes decisions on horizontal topics, and mediates in case manufacturers cannot agree within technical working groups. The Commission consists of national Member Associations, receiving two votes per country independent from its size or economic weight.

#### 3. How European is the association?

More than 90 per cent of manufacturers within Eurovent manufacture in and come from Europe. They employ around 150.000 people in Europe largely within the secondary sector. Our structure as an umbrella enables us to consolidate manufacturers' positions across the industry, ensuring a broad and credible representation.

#### 4. How representative is the organisation?

Eurovent represents more than 1.000 companies of all sizes spread widely across 20+ European countries, which are treated equally. As each country receives the same number of votes, there is no 'leading' country. Our national Member Associations ensure a wide-ranging national outreach also to remote locations.

Check on us in the [European Union Transparency Register](#) under identification no. 89424237848-89.

### We are Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies – thinking 'Beyond HVACR'

Eurovent is Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies. Its members from throughout Europe represent more than 1.000 companies, the majority small and medium-sized manufacturers. Based on objective and verifiable data, these account for a combined annual turnover of more than 30bn EUR, employing around 150.000 people within the association's geographic area. This makes Eurovent one of the largest cross-regional industry committees of its kind. The organisation's activities are based on highly valued democratic decision-making principles, ensuring a level playing field for the entire industry independent from organisation sizes or membership fees.

Eurovent's roots date back to 1958. Over the years, the Brussels-based organisation has become a well-respected and known stakeholder that builds bridges between the manufacturers it represents, associations, legislators and standardisation bodies on a national, regional and international level. While Eurovent strongly supports energy efficient and sustainable technologies, it advocates a holistic approach that also integrates health, life and work quality as well as safety aspects. Eurovent holds in-depth relations with partner associations around the globe. It is a founding member of the ICARHMA network, supporter of REHVA, and contributor to various EU and UN initiatives.