Eurovent Position Paper PP – 2023-09-14

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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.[1]

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Appendix

[1] 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[2] 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 O3. 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)

[2] Environmental Effects of Stratospheric Ozone Depletion, UV Radiation, and Interactions with Climate Change - March 2023: EEAP-2022-Assessment-Report-May2023.pdf (unep.org)

- 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 FGAS 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 n 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 shorten.

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.

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

In a nutshell

With this paper Eurovent provides complementary information to the public consultation on the REACH PFAS restriction proposal for 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.

1 Introduction

The recently published REACH restriction proposal on PFHxA, its salts and related substances, which originally addressed the crucial C6 for the air filtration industry, has narrowed its scope and excluded professional and industrial applications.

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 PFHxA (C6) containing media air filters, are now covered by the restriction on all PFAS.

Eurovent represents a vast majority of European manufacturers of air filters for HVAC applications. A clean and sustainable environment is of utmost importance to Eurovent's members, which provide state-of-the-art technology for high-efficiency air filtration at the lowest energy demand, contributing to both health protection and global decarbonization goals.

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As complementary information, in the following sections we provide an overview of the HVAC filtration sector and the potential impact of the early restrictions on air filters with PFHxA (C6) containing media.

2 Overview of the HVAC filtration sector affected by the C6 restriction

2.1 General classification of air filters in HVAC systems

In basic terms, air filters applied in ventilation and air-conditioning systems (HVAC) of buildings are classified depending on their **efficiency of particles filtration**. The three basic groups include.

- Coarse filters, which are capable to separate only relatively big contaminants (particle size over 10 μm), that include for instance pollens or some fungal spores. They are normally used

as pre-filters or filters for applications not demanding high Indoor Air Quality. According to EN ISO 16890, these filters are classified in ISO Coarse group.

- Fine filters, which are able to separate the harmful particles of sizes smaller than 10 μm and are essential in most ventilation applications. According to EN ISO 16890, these filters are classified in ISO ePM1, ISO ePM2.5 and ISO ePM10 groups.
- Efficient, High Efficiency and Ultra-High Efficiency Particulate air filters (EPA, HEPA, ULPA) which feature very high efficiency for separation of very small particles (much below 1 μm). These are special filters used in specific applications requiring very clean air, for instance high-risk food production, clean rooms for pharmaceutics or electronic manufacturing, laboratories or surgical theatres. These filters fall under the standards EN1822 and ISO29463.

2.2 Applications, key functions and features of HVAC filters

2.2.1 Non-residential and residential buildings – human health and hygiene issues

Air filters are an essential element of any modern mechanical ventilation system in a non-residential or residential building. Their primary function is to purify the air supplied to the building of pollutants contained in the outdoor air and provide adequate Indoor Air Quality (IAQ). The contaminants include particles matters (PM) which have an adverse effect on health. The smaller the size of the pollution particle, the more harmful it is to human health. Depending on the outdoor air quality in a specific location, air filters classified as ISO ePM1, ePM2.5 or ePM10 are normally used to provide correct IAQ. While, in applications requiring very clean indoor environment (e.g. medical applications including operating theatres, pharmaceutical production), ULPA, HEPA, EPA or ISO ePM1 filters are required.

In addition to provision of good IAQ or high indoor are cleanliness, air filters protect interior of ventilation system (air ducts and ventilation devices), which is essential for hygienic requirements.

In the vast majority of public buildings constructed over last 30 years, mechanical ventilation with filtration is standard. It is a necessity e.g. in healthcare buildings, particularly hospitals, pharmaceutical production. Mechanical ventilation is also becoming widespread in the segment of new residential buildings, since the requirements of the Energy of Building Directive (EPBD) in many cases cannot be met without mechanical ventilation including filtration.
The Renovation Wave Strategy of the European Commission, which aims to at least double renovation rates, will result in further increase of mechanical ventilation systems with filtration in the stock of existing non-residential and residential buildings.

2.2.2 Industry sector – quality and safety requirements for products

High indoor air quality and effective filtration is necessary in most industrial sectors, in order to meet the hygienic requirements of the manufacturing process and to ensure the quality and safety of products. This applies in particular to the food manufacturing, cosmetics, pharmaceutical and electronics industries, where air quality must meet the highest standards.

2.3 Energy consumption

Transport of the air in mechanical ventilation systems involves the consumption of electricity. The main factor impacting energy consumption is airflow resistance (pressure drop). The contribution of air filters to the total flow resistance of the system is high. Thus, providing a low filter pressure drop is crucial in terms of energy savings. The air flow resistance of a filter changes over time. It is lowest when the filter is clean (new) and increases with clogging by collected dust. The **annual energy consumption** (AEC) related to the filter is proportional to its average pressure drop over service time.

The key factor impacting the average pressure drop is the **dust holding capacity**. The higher dust holding capacity, the lower average pressure drop and annual energy consumption.

2.4 European policies and regulations on filtration efficiency and energy efficiency of filters

The issues of IAQ and required filtration efficiency are governed by a number of national regulations. However, these requirements are not harmonized at European level yet. It is expected that the ongoing revision of the EPBD will lay down the EU-wide minimum requirements for IAQ and filtration.

The energy efficiency of air filters in ventilation systems is addressed in the ecodesign Regulation EU 1253/2014. It lays down the minimum requirements for the energy consumption of ventilation units with consideration of clean filter pressure drop. This regulation is currently under revision, and it is expected that the amended Regulation (publication awaited in 2022) will implement minimum requirements for the filter annual energy consumption (AEC).

2.5 Relation between C6 and key properties of air filters

The proposal for PFHxA restriction also covers C6 fluorinated chemistry. C6 is an additive used in the production of filtration media. It is responsible for the key properties of air filters like durable water repellency and high dust holding capacity.

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).

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2.6 Associated C6 emissions to the environment

Emissions during production of filtration media and filters are negligible. No emissions are expected during the use of filters. At the end-of-life phase, the vast majority of HVAC filters (over 98% corresponding to non-residential applications) as fluorine containing waste are collected by professional companies and subject to incineration in incinerating plants. These plants are equipped with flue gas cleaning technology that includes multistage wet scrubber using calcium hydroxide (Ca(OH)2) respectively lime milk to wash the flue gas. Hydrogen fluoride will be transformed to calcium fluoride (CaF2). CaF2 is the principal source of hydrogen fluoride, a commodity chemical used to produce a wide range of materials.

2.7 Size of the HVAC air filtration market potentially affected by C6 restriction

One of the few reliable and comprehensive statistics on market of air filters for ventilation is delivered by Eurovent Market Intelligence (EMI), which is the European Statistics Office on the HVAC&R market

established in 1994. The guiding principle of EMI is to establish a detailed map of the European, Middle Eastern and African market with the participation of the manufacturers in the data collections. EMI direct collections for the air filtration industry cover nearly 70% of the market.

According to EMI, the total European air filters market in 2020, expressed in sales amounted to **1.057,46 million euro**, including **894.44 million euro** only for EU28. While considering Africa and Middle East it amounted to **1.098.20 million euro**

The projected air filters 2021 market by country (sales in million euro) is present on Figure 1.

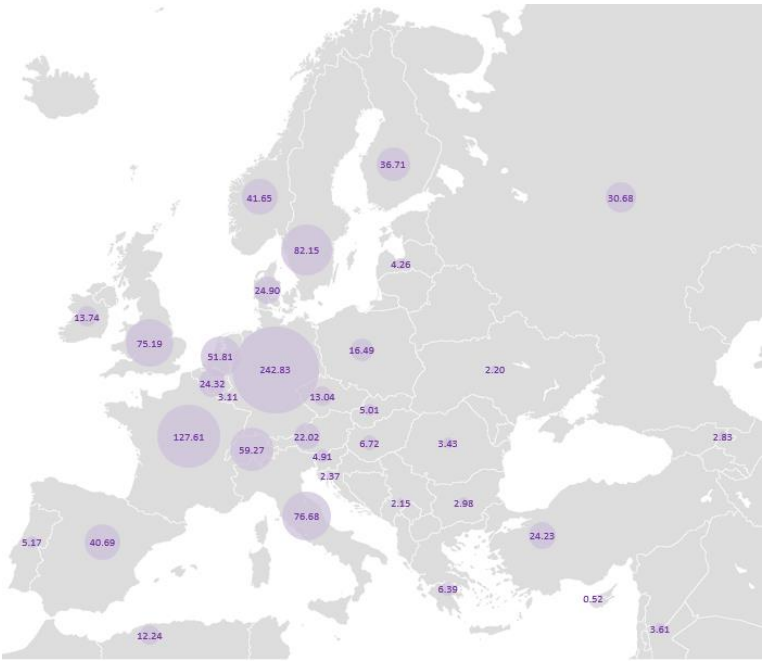

Figure 1. Air filter total market 2021. Estimation based on 2020 sales

A non-exhaustive list of major European manufactures supplying air filters includes 106 companies.

Regarding the market type, 18.2% filters were installed in all types of newly constructed buildings where HVAC equipment is installed for the first time, and 81.8% of filters were installed in all types of already functioning buildings where HVAC equipment was installed previously and now being reinstalled for the renovation/upgrade and/or other purposes.

The split by applications, where filters are used is presented in Figure 2.

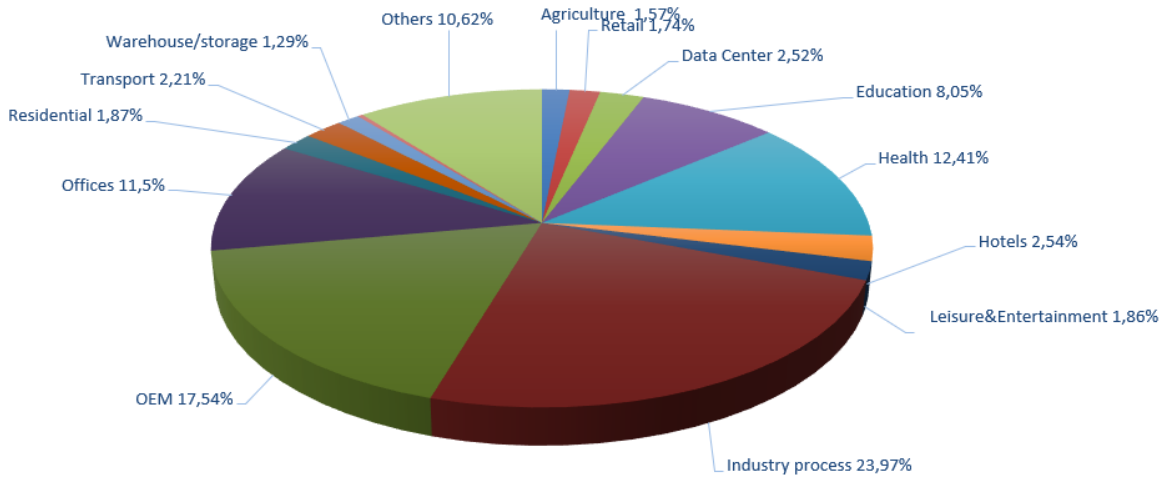

Figure 2. Split by application. Based on sales volume in 2020.

3 Consequences of the C6 restriction used in the production of filtration media

3.1 Risk to the safety of products and controlled indoor environment

High efficiency air filtration is essential for the production process in many sectors, including medicines, medical products or food. With improper filtration, the properties and safety of using these products may be impaired. C6 is responsible for the durable water repellency of filtration media which in turn is necessary to guarantee the declared efficiency of filtration under any operating condition. Restriction of C6, for which an alternative providing appropriate water repellency is not available, could pose a risk to users of these products.
Similar risks may arise in rooms with controlled high air cleanliness, like operational theatres or bio-hazard laboratories.

3.2 Increase energy consumption

C6 is essential in providing high dust holding capacity, which effects annual energy consumption related to air filters. Restriction of C6 may prevent meeting the ecodesign requirements for air filters and thus the achievement of decarbonization targets set out in the European Green Deal strategy.

3.3 Economic burden for filter manufacturers

Since the equivalent alternative for C6 is not available, its restriction would entail a long and costly process for industry to develop (by filter media suppliers) and adopt (by filter manufactures) a substitute. The sector just completed its transition from C8 to C6 which already took 5 to 10 years, which represented a heavy economic burden on the industry. Transitioning to non-fluorinated chemistry will take even more time and be significantly costlier.

Once the alternative is proposed by filter media suppliers, the filter manufacture will be forced to:

- verify and, if needed, re-engineer processing method for new filter media in filter production,
- re-test in labs the performance of all manufactured filters using the new filter media,
- redo field test to verify the performance under real operating conditions (most time-consuming test),
- redo fire resistance test for filters made of new filter media.

3.4 Social costs

Restriction for C6 could cause a long-term disruption of supply chain resulting in direct consequences of downstream filter users.

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Eurovent and transparency

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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.