Team member	Phone	Email	Date
Igor Sikonczyk	+32 (0)466 90 04 01	igor.sikonczyk@eurovent.eu	2021-05-06

PFHxA (C6) Restriction Proposal under REACH Regulation

In a nutshell

With this paper Eurovent provides complementary information to the public consultation on the socio-economic consequences (SEAC) regarding the consequences of C6 restriction for HVAC filtration sectors. The paper aims to support Kreab's derogation request for high-performance filtration and separation media.

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

1.1 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.

1.2 Applications, key functions and features of HVAC filters

1.2.1 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.

1.2.2 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.

1.3 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.

1.4 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).

1.5 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).

1.6 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.

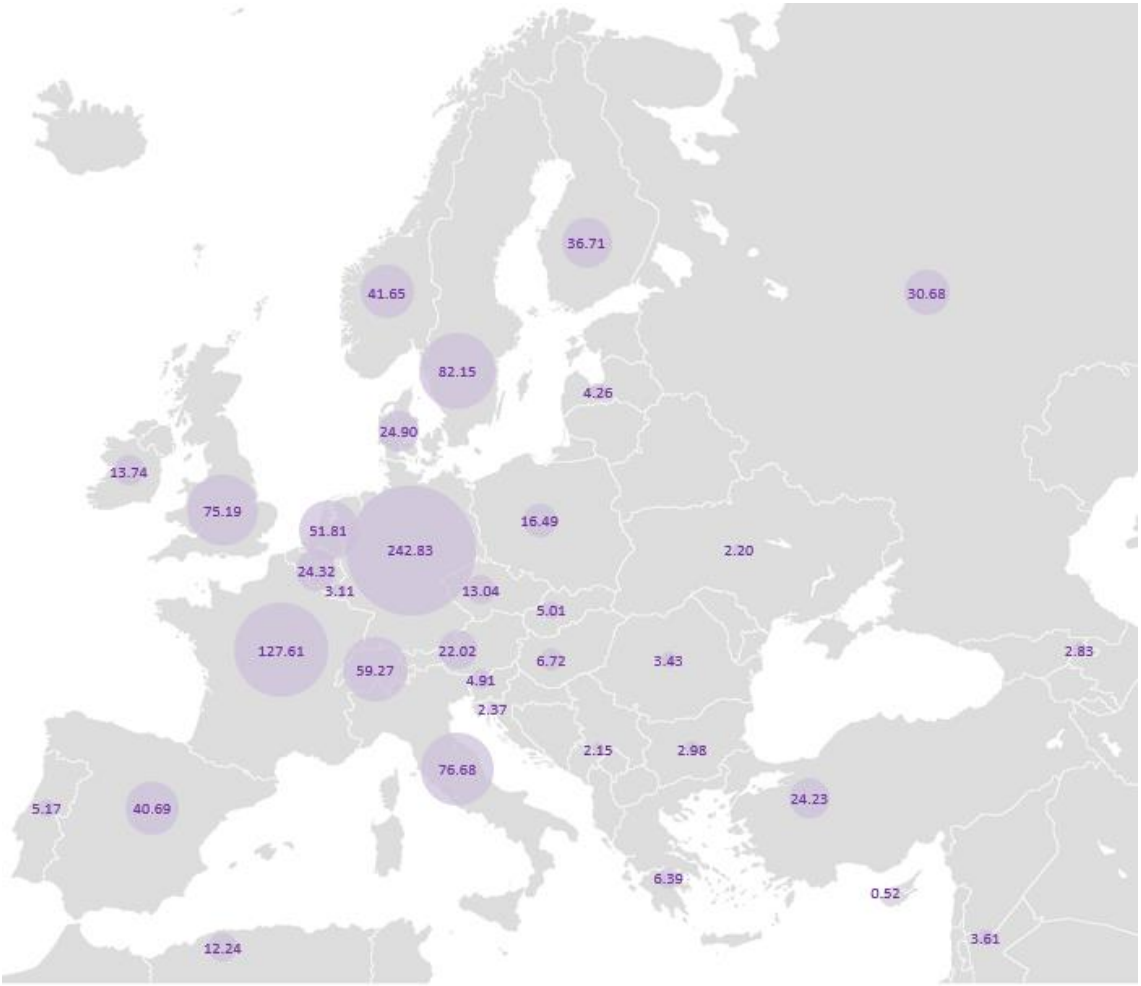

Figure 1. Air filter total market 2021. Estimation based on 2020 sales

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.

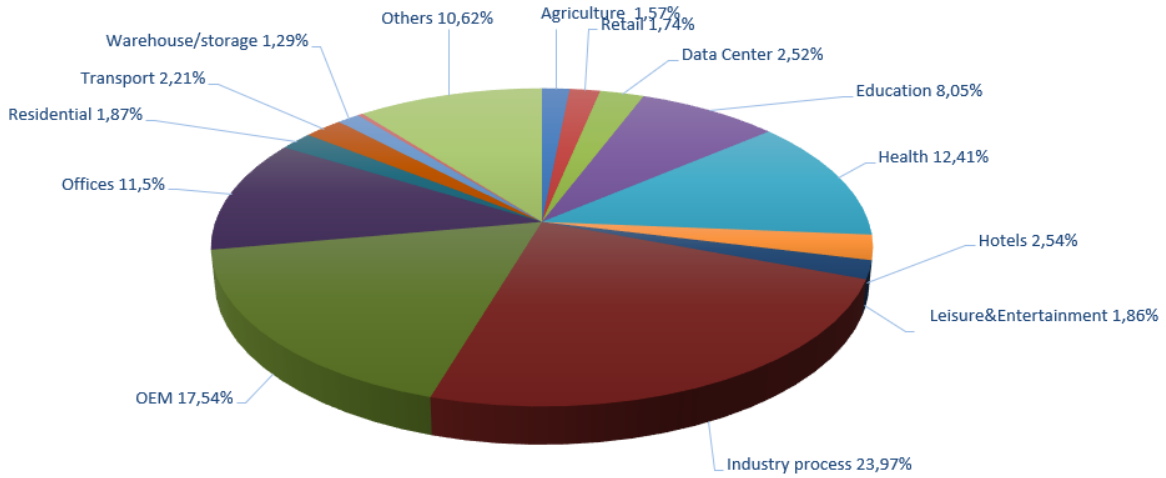

Figure 2. Split by application. Based on sales volume in 2020.

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

2.1 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.

2.2 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.

2.3 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.

2.4 Social costs

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

Eurovent AISBL / IVZW / INPA
European Industry Association
EU Trans. Reg.: 89424237848-89

80 Bd A. Reyers Ln
1030 Brussels
BELGIUM

www.eurovent.eu
+32 (0)466 90 04 01
secretariat@eurovent.eu

Fortis Bank
IBAN: BE 31 210043999555
BIC: GEBABEBB

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.

Delivery annotation

Recipient	Kreab Consultancy, Ms Maria Morera (maria.morera@kreab.com)
Concerns	Complementary information to be used by Kreab in the feedback to the public consultation on the socio-economic consequences (SEAC) regarding the consequences of C6 restriction for HVAC filtration sectors. The document aims to support Kreab's derogation request for high-performance filtration and separation media