

Factsheet “PFAS in electrical household appliances”

Household appliances make the lives of consumers easier every day. It is a concern of the household appliance industry to produce safe household appliances that meet the expectations of consumers. Development and production are carried out with the utmost care. The selection of the materials used at the beginning of a production process is therefore an important step towards obtaining a reliable product. The supply chain of a household appliance is long and complex. A lot of information is passed along the supply chain - but not all of it. Many manufacturers of household electrical appliances do not have comprehensive information on PFAS processed in their products, as there is no obligation to provide information along the supply chain. Due to the complex supply chain and the variety of individual substances to be checked, which are grouped under PFAS, it is therefore not possible at the present time to carry out a conclusive assessment on the use of PFAS in household electrical appliances. The present assessment can therefore be continuously supplemented.



Product(s):

- Household appliances are indispensable in every household, which is why a universal PFAS ban would primarily affect consumers. PFASs, especially fluoropolymers, are relevant to produce a wide variety of products in the household appliance industry and affect the following product groups (list not exhaustive):
- **Refrigerators:** refrigerators, freezers, ice-cream makers;
- **Cooling, heating and/or dehumidifying appliances:** air conditioners, water heaters, air purifiers and dehumidifiers;
- **Washing and/or drying appliances:** dishwashers, washing machines, tumble dryers, washer-dryers (all with/without heat pump technology);
- **Cleaning appliances:** hoovers, washing vacuums, window vacuums, floor cleaners, wet/dry/ash vacuums, high-pressure cleaners, steam cleaners, air purifiers;
- **Cooking appliances:** sandwich toasters, waffle irons, electric grills, hot air fryers, coffee makers, ovens, blenders, food processors, cookers, slow cookers, rice cookers.



Market Information:

- Europe-wide turnover in the household appliances market (large and small appliances) is estimated at around 90.41 billion euros in 2023. Annual turnover growth of just under 4.7% is expected over the next five years. In 2022, sales of household appliances in Germany generated a turnover of around 17.6 billion euros.
- PFASs are used in many different components and parts of the household appliance industry. Due to the wide range of applications, it is not possible to make a concrete estimate of the proportion of jobs and turnover accounted for by products containing PFASs.
- As products used by the consumer in everyday life, good performance and reliability, for example through consistently reliable heat and water resistance, sensible seals as well as well running grinders (e.g. in coffee machines), are particularly important for household appliances. Doing without the polymers used could reduce these two particularly important properties and lead to higher resource and energy consumption through the increased use of replacement and wear parts, which is contrary to the goals of the EU Green Deal.



Requirements Profile

- Household electrical appliances have to withstand many stresses in everyday life. Consumers use the appliances every day to facilitate many activities. Household electrical appliances must be built accordingly. Here, PFASs help, for example, to make surfaces scratch-resistant and appliances particularly heat-resistant, or to make rubber seals more flexible.
- For large electrical household appliances, the corresponding ecodesign regulations provide for the stocking of spare parts for several years after the last appliance was placed on the market. In this way, consumers should have reliable access to spare parts. These spare parts contain the same substances as the appliance produced. A ban on PFAS in spare parts would thus artificially reduce the lifetime of large electrical household appliances, as even minor repairs would no longer be possible.
- Many household electrical appliances have a cable for the power supply. Cable sheaths must be resistant to flying sparks so that they are not set on fire. PFASs are used in the cable sheathing for this purpose.
- The use of PFAS enables long-lasting components and products because they are resistant and robust. This leads to low spare parts consumption and service requirements.



Identified PFAS Uses In the finished product

1. Electrical and electronic components	
PFAS substance/substance group: PTFE; PVDF	PFAS-containing material/component: e.g. motor, cable, plug
Reason for PFAS Use/ Requirements Profile: - General functionality of the product as well as its safety (e.g. for cable insulation). - High temperature resistance (e.g. for thermal protection of electrical insulation hoses) - Anti-drip, PTFE has high thermal stability and flame resistance	
2. Seals	
PFAS substance/substance group: PTFE, FEP, FKM, PVDF, PVDF-HFP	PFAS-containing material/component: E.g. plastics and rubber materials
Reason for PFAS Use/ Requirements Profile: - Higher wear resistance - Lower food contact migration than comparable materials	
3. Coatings	
PFAS substance/substance group: PTFE, FEP, PFA	PFAS-containing material/component: E.g. displays and other surfaces
Reason for PFAS Use/ Requirements Profile: - Stain/oil/water resistance - Easier cleaning of the surface (for non-stick coatings) - Scratch resistance - Heat resistance - Chemical resistance	
4. Lubricants	
PFAS substance/substance group: PTFE	PFAS-containing material/component: E.g. bearings
Reason for PFAS Use/ Requirements Profile: Reduction of oil requirement, improvement of the mobility and durability of bearings and components	

Substitution

- For the majority of components with PFAS use, no substitutes are known and/or in prospect.
- Substitutes for PFASs tested so far in the household appliance industry include polyamides, (PA), polyetheretherketone (PEEK), ceramic coatings, white latex, silicones, molybdenum disulphide (MoS₂), graphites and magnesium stearate dihydrate (MgSt-D) for electrical components (especially cables), lubricants, plastic and rubber materials and non-stick coatings. The use of the above substitutes significantly deteriorated the quality, safety and durability of the products.
- Only about 10% of the entire product portfolio of the household appliance industry would be able to maintain the usual performance. Even with a change in the materials used and production, it is very unlikely that products of comparable quality could be brought to market in a timely manner.
- In the case of substitution, it must always be taken into account that the customer expects the same product characteristics from the supplier. In order to ensure this, elaborate safeguards are required through test runs with prototypes that have been built with the substitution substances. Such validation tests (also known as product validation) are time-consuming (at least 1 - 2 years) and very expensive.

Safe Use: Prevention and Reduction of Emissions and Exposure

- Electrical appliances are usually recycled properly after use.
- Sorting residues containing PFAS are disposed of properly and in accordance with defined standards of the German WEEE legislation (ElektroG).
- In the production of household electrical appliances, attention is paid to the appropriate legal protection for workers in the workplace.

Socio-economic Impact

Consequences of the Proposed Restriction

- A universal PFAS ban would mean a significant drop in sales for the household appliance industry, resulting in the loss of tens of thousands of jobs across Europe.
- The ban on PFASs will greatly reduce the lifespan of certain components due to a lack of sufficient resistance, leading to increased spare parts consumption and service requirements.
- The sector would not be able to guarantee its current - and consumer-desired - product performance. Even more, a significant deterioration in product performance across the sector is to be expected. Not only is a significant weakening of the competitiveness of European products on the global market suspected, and illegal imports of products produced abroad and containing PFAS feared.
- If substitutes were used, there would be increased safety risks, for example due to the danger of flammability of products.
- Components in which PFASs are used can be crucial for the functionality of a product. Re-qualification and re-certification of these components and products already on the market is subsequently required. There may not be sufficient third-party certification companies available to provide these required recertification services in a timely manner. Such complex recertification and re-qualification procedures are very time-consuming, both because of the lack of testing bodies and their technical complexity.
- Suppliers of novel technologies cannot test and ensure that the alternatives to PFAS they find are suitable for all uses of their components. Moreover, if alternatives are only found by individual companies, it cannot be assumed that they are sufficiently available on the market.

Required Transition Period and/or Derogations

- As the current data situation on PFAS within the sector of household electrical appliances is insufficient or hardly available, longer transition periods and differentiated consideration of PFAS are necessary. The reason for this is that manufacturers do not yet have complete transparency of the supply chain.
- We also propose an exemption for b2c products for fluoropolymers and fluoroelastomers and a longer transition period of several years. This would give the household electrical appliances sector sufficient time to change.



Our sector offers:

- The household appliances industry understands that the legislator wants to protect consumers. This is also in the interest of the household appliance industry. The use of products must be safe, and consumers must be able to make informed purchasing decisions. Nevertheless, we would like to point out that substitutes for PFAS applications are currently only known for individual applications in the household appliance sector. The industry therefore suggests introducing a transition period for household appliances. This would give the industry time to develop and test suitable substitutes. During this transitional period, it would be possible to label products containing PFASs.

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