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PFAS

**To the kind attention of
The five Member State authorities and to
ECHA**

Response to Registry of Intention by the fluoropolymer user industry

1. About Pro-K and Dr. M. Schlipf

Pro-K Industrieverband Halbzeuge und Konsumprodukte aus Kunststoff e.V. (Pro-K) represents manufacturers of consumer and semi-finished plastic products. It aims to demonstrate the diverse application possibilities of plastics, offers training about products, how to process it and also provides updates on the periodic revision of regulations. Thus, the pro-K actively promotes the image of plastics and their products.

Due to the special structure of the members of pro-K, focusing mainly on processing of Fluoropolymers, part manufacturing and application of those, in an ideal manner the involvement of downstream users into the PFAS process can be provided by the pro-K association.

Dr. Michael Schlipf, Member of the Board and Chairman of the Fluoropolymer Group of pro-K, has played a vital role in organizing the processors and manufacturers of fluoropolymers in pro-K. He has been active in the world of fluoropolymers since 1985. During his work in research, application development and marketing, Dr. Michael Schlipf gained extensive experience in the production, processing and application of fluoropolymers.

2. REACH PFAS restriction proposal and Stakeholder consultation

The 4 EU Member States (Germany, the Netherlands, Sweden, and Denmark) and Norway are working on a REACH restriction proposal to limit the risks to the environment and human health from the manufacture and use of all per- and poly-fluoroalkyl substances (PFAS).

On 15th July 2021, these five countries formally announced their intention to prepare a restriction proposal for PFAS by submitting the **Registry of Intention (RoI)**. Fluoropolymers are also included in the scope. **The restriction proposal is intended to be submitted to ECHA by 15th July 2022.** Along with the Registry of Intention(RoI), BauA (Federal Institute of Occupational Safety and Health) released a

second stakeholder consultation on PFAS restriction to collect additional information to fill data gaps to present a tailored restriction proposal - [Survey Powered by Webropol: 2nd Stakeholder Consultation on a Restriction for PFAS \(webropol.com/surveys/2nd-stakeholder-consultation-on-a-restriction-for-pfas\)](https://webropol.com/surveys/2nd-stakeholder-consultation-on-a-restriction-for-pfas). The second consultation is available in English and is open from **19th July 2021 to 19th September 2021**.

3. Response on RoI by the fluoropolymer user industry

Pro-K would like to provide fluoropolymers processors and users' perspectives on RoI to ensure the resultant REACH restriction proposal is based on comprehensive data and information covering all critical aspects of fluoropolymers, including their complete life cycle, societal benefits, and essential applications of use. Different 'end-of-life' reusability scenarios, already in use or currently under development, based on fluoropolymer user's feedback, are considered to support circular economy.

Preparation of restriction proposal (Annex XVII Dossier) for a large group of chemical substances such as PFAS is highly complicated. PFAS are a vast universe of different meanings with different physical, chemical, environmental, and biological properties. The 'One size fits all' approach is not suitable.

Fluoropolymers are different from other PFAS substances because:

- They **do not share the toxicological and environmental profiles** associated with PFAS that could be considered a concern.
- They have **unique physicochemical properties** that constitute a distinct class within PFAS.
- Fluoropolymers meet the OECD polymer of low concern criteria, which means they are non-toxic, bio-compatible, non-soluble and immobile molecules, and they are deemed as such to have insignificant environmental and human health impacts.

Therefore, fluoropolymers should not be grouped with other PFAS for regulatory purposes based on a C-F bond.

4. Report on Total PFAS emissions in the EEA:

Concerning [Report summary PFAS and PFAS polymer production July 2021.pdf](#) published by BauA, based on data collected from the first Call for Evidence in 2020, production and emissions of total PFAS vs fluoropolymers in EEA is estimated in the table below:

Total PFAS emissions in EEA with break up for Fluoropolymers, F-gases and Other PFAS				
	Total PFAS	Fluoropolymers	F-gases	Other PFAS
Production/Processing (tonnes)	194.787	75.610	33.200	85.977
Total Emissions (tonnes)	726,1	19,6 (2,69%)	684,2 (94,2%)	22,3 (3,07%)

As seen from above, total emissions from fluoropolymers are only 2,69% of the total PFAS emissions in EEA, whereas F-gases contribute 94,2% and, therefore, F-gases are the main contributor to the overall PFAS emissions.

F-gases are also regulated in the EU under F-gas regulation No.517/2014 - [EUR-Lex - 32014R0517 - EN - EUR-Lex \(europa.eu\)](#). This regulation is only aimed to reduce fluorinated greenhouse gas emissions. Persistency criteria is not covered in the scope.

5. Manufacturing of fluoropolymers and related PFAS emissions:

Out of the 2.69% share of fluoropolymers of total PFAS emissions in EEA, the main concern lies in use of fluorinated polymerization aids in the manufacturing of fluoropolymers and their emissions thereof.

It is pertinent to mention here that not all fluoropolymers are manufactured using fluorinated polymerization aids. Based on an estimate by Pro-K, at least 50-60% of fluoropolymers do not require fluorinated polymerization aids. This large share of fluoropolymer industry, not using any polymerization aids or using non fluorinated polymerization aids, are expected to have virtually negligible PFAS emissions.

With regard to the remaining fluoropolymers which use fluorinated polymerization aids, most of their PFAS emissions are from their manufacturing and processing units which are localized. Therefore, Pro-K strongly recommends that these manufacturing units apply already available techniques to minimize emissions of fluorinated substances along the individual steps of the manufacturing process. Among these are condensation of sublimated fluorosurfactants within the powder drying modules, recovery of these substances from the drying air by absorption or filters, and remove residual amounts of fluorosurfactants from the process water by using techniques such as ion exchange technology. These methods are existing, partially patented and well-approved. Their use can be multiplied in the application by licensing.

It is a general target of these efforts, to clean the fluorosurfactants after recovery and thus make them ready to be re-used for the next polymerization cycle.

Of course, also the processor and end user industry units must minimize their PFAS emissions to protect the environment around their units.

6. Reducing the use of fluorinated polymerization aids

Fluoropolymer manufacturing industry is reported to be committed to further reduce emissions in the environment by deploying best available techniques for PFAS emission controls such as by recovery and recycling, containment using absorption beds, scrubbing and incineration of fluorinated polymerization aids.

Pro-K urges all the downstream processing and end user industry of fluoropolymers to minimize their PFAS emissions, if any. In this regard, highlighted are the manufacturing steps of sintering, injection molding, coating and extrusion. Pro-K shall facilitate the availability of best available techniques in this regard as these are already well-established practices in this industry.

In addition, fluoropolymer resin manufacturing industry is working on reducing the use of fluorosurfactants per unit production of fluoropolymers. Also, the long carbon chain compounds are

substituted by shorter carbon chain fluorosurfactants and the efficiency of these can be enhanced by the incorporation of non-fluorine spacers located in the carbon main chain.

As a result of all the above efforts, the PFAS emissions related to fluoropolymers are likely to keep getting further reduced in a progressive manner in the near future.

7. Replacing the use of fluorinated polymerization aids with non-fluorinated polymerization aids

Fluorinated surfactants are currently preferred due to their high performance in fluoropolymer manufacturing resulting in higher productivity, better quality, and greater flexibility to produce wide range of products with critical specifications. Even though the use of non-fluorinated surfactants in manufacturing of fluoropolymers is known to the industry since many decades; with a non-fluorinated surfactant there are challenges in achieving the desired quality specifications required for challenging applications, generation of low molecular weight fractions, lower productivity, higher manufacturing costs etc. Due to these constraints, the use of non-fluorinated surfactants is so far limited.

Nevertheless, Pro-K has understood from reliable sources, among these are recent patent applications, that Fluoropolymer resin manufacturing industry is working diligently to develop non-fluorinated polymerization aids as an alternative to fluorinated polymerization aids, wherever possible. Different manufacturers are likely to be at different stages of development with various fluoropolymers and their respective grades. When commercialized, this will significantly further increase the percentage of fluoropolymers made without the use of fluorinated polymerization technology which eventually shall further reduce the PFAS emissions to environment.

As per Pro-K, it is important to encourage the fluoropolymer industry to share non-fluorinated polymerization technologies, as and when commercialized, for licensing to other fluoropolymer manufacturers to ensure that the industry will be able to overcome the emissions challenge quickly and grow for the betterment of all end users, and in turn of the overall society.

8. Fluoropolymers and EU Green Deal:

Fluoropolymers have a unique combination of functionalities and are used in numerous technologies, industrial processes, and everyday applications. Fluoropolymers are expensive and, therefore, they are used only when necessary. For example, new megatrends such as 5G data transmission, cannot be realized without the use of special, fully-fluorinated fluoropolymers.

Fluoropolymers play an important role in achieving EU Green Deal objectives and UN Sustainable Development Goals (UN SDG) because of their critical use in Lithium-ion batteries, Green hydrogen and fuel cell technologies, solar panels or wind turbines. Electrolysers for converting renewably, electrical energy sourced by PV and wind turbines, into Green Hydrogen, use functionalized fluoropolymer membranes to enable energy conversion safely. Thus, this technology helps to reduce the carbon footprint and thereby protect the environment.

The reference report by BauA states that *'In terms of environmental and human health impacts of introducing alternatives for fluoropolymers, there is, according to industry, a potential for higher risk of exposure to hazardous substances in alternatives used to meet the high standards of fluoropolymers in many applications. This brings higher safety risks, increases in emissions resulting from technical regression, and could put Europe's goals for climate and energy at risk'*.

9. Recommendations

Fluoropolymers are inherently safe, non-mobile, non-bio accumulative and non-toxic. Fluoropolymers ensure safety, reliability, durability and performance in numerous technologies, industrial processes and everyday products that are critical for human health, safety, and the environment. Fluoropolymers have a well-established safety profile and meet the globally accepted 'Polymers of Low Concern' (PLC) criteria.

The unique characteristics of fluoropolymers make them a critical material for a broad range of industries and sectors, playing a diverse and crucial role for society for EU Green Deal and UN SDGs, with few, if any, viable alternatives.

Representing Fluoropolymer user industry, Pro-K recommends that authorities would serve EU needs the best by riding on the benefits of fluoropolymers considering the fact that their share in the overall PFAS emissions is already very low and the entire industry including manufacturers, processors and end users are making efforts to further minimize their PFAS emissions.

Pro-K, therefore, **strongly advocates for an exemption of fluoropolymers from the PFAS restriction proposal.**

Main references:

[Report summary PFAS and PFAS polymer production July 2021.pdf](#)

[Per- and polyfluoroalkyl substances \(PFAS\) - Registry of restriction intentions until outcome - ECHA \(europa.eu\)](#)