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FEC Position on PTFE-based non-stick cookware

PTFE (Polytetrafluoroethylene) was discovered more than 80 years ago in 1938 and is used as non-stick coating for cookware since 1950. This fluoropolymer has unique properties being non-stick to water and oil, thermally stable, and chemical resistant. Due to these properties PTFE is used in many important medical and industrial applications, e.g. in surgery or the food industry.

PTFE is just one example of a very large group of man-made chemicals called PFAS (per- and polyfluoroalkyl substances). Analogously to PTFE, these PFAS have an enormous range of applications such as firefighting foams or many parts in cars or electronic chips e.g. as used in smartphones and tablets. It can be assumed that PFAS play a crucial role in many devices of modern life.

The number of PFAS is not clear, but according to the US Environmental Protection Agency (EPA) the number exceeds 8'000 substances[1]. PFAS are under scrutiny by regulators around the world because they are very stable and have a very long lifetime in nature ("forever chemicals"), some of them have negative health effects and they can accumulate in organisms (human and animal) and the environment.

However, between them are significant differences in their physical, chemical, and toxico-logical properties. Therefore, it would be appropriate to modulate possible legal restrictions on the basis of their individual properties instead of an entire ban of all PFAS as currently proposed. This focused approach has been taken for two PFAS already, PFOS (perfluoro-octanesulfonic acid) and PFOA (perfluorooctanoic acid) were forbidden in 2006 and 2020 respectively.

Fluoropolymers, a sub-group of PFAS, have different properties compared to other PFAS with very long carbon chains making them less mobile. Studies on PTFE coatings have shown no toxic properties, no skin irritation and no allergen reactions. Furthermore, these studies concluded that PTFE is classifiable as non-carcinogenic[a].

It was noted by the Global PFAS Science Panel that PTFE coated cookware has a low concern while using it in the kitchen[2]. In August 2019, the German Institute for Risk Assessment, a highly renowned scientific body, wrote that "*toxicologically relevant migration of PFOA* (one of the PFAS of highest concern) *from non-stick coated cookware is unlikely to happen if the production is done under `Good Manufacturing Practice´* [b].

Based on these scientific results, FEC recommends to refrain from banning PFAS as a whole group and to continue to utilize fluoropolymers as long as there is no adequate replacement available.

A variety of PFAS are used in the manufacturing of fluoropolymers and they might get into the environment at the end of life[3]. To avoid this, the main fluoropolymers manufacturers (organized within Plastics Europe) have committed to responsible manufacturing principles in terms of continuously improving and developing the best available techniques in the manufacturing process, management of environmental emissions, development of R&D programs for the advancement of technologies allowing for the replacement of small PFAS in the manufacturing processes and increase of recyclability and reuse of their products in line with the objectives of the circular economy.

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In addition, FEC recommends manufacturers of fluoropolymers to closely monitor their production plants and adopt all existing state-of-art technologies to prevent and remediate any possible emissions.

If concerns about environmental problems throughout the full lifecycle of PTFE remain valid, why should cookware coated with this material be produced in the future? Because no other material has a long-term non-stick performance comparable to PTFE. As a result, less oil is needed in the frying process allowing for a healthy diet and the amount of burnt food or food waste is lowest. In addition, the lifetime of the non-stick performance is longest on PTFE coated cookware. The more often a piece of cookware is used the lower is its lifetime carbon footprint. Thereby, PTFE supports the sustainability development goals health, hunger and climate change of the United Nations.

In recent times, an initiative led by five European Countries aims at introducing strong legal restrictions on PFAS in all the so-called "non-essential uses". FEC believes that grouping all 8'000 substances irrespective of their structure and, consequently, their potential toxic properties does not reflect the current scientific findings. In the current European chemical legislation as well as in the legislation on food contact materials, the protection of human health and environment and the functioning of the internal market are set as guiding principles. The most efficient steps to protect human health and environment would start with classifying PFAS into sub-categories based on all relevant properties that determine their potential toxic properties and their probability to get in contact with human beings or the environment. Only after that, measures targeted to restrict the most dangerous substances should be taken. Due to the fact that fluoropolymers are a non-toxic sub-group of PFAS, we believe that they should be exempted from the restriction process.

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1 US Environmental Protection Agency, "PFAS structures in DSSTox (update August 2020" (EPA, 2020); https://comptox.epa.gov/dashboard/chemical_lists/PFASSTRUCTV3.
2 Rainer Lohmann et al, "Are Fluoropolymers Really of Low Concern for Human and Environmental Health and Separate from Other PFAS?", Environ. Sci. Technol. 54, 12820 (2020)
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a IARC Monographs, Volume 19, 1979, IARC Monographs, Supplement 7, 1987
b https://www.bfr.bund.de/cm/343/neue-gesundheitsbezogene-richtwerte-fuer-die-industriechemikalien-pfos-und-pfoa.pdf