

Notification in the Context of Obsolescence Management

Possible restriction on the use of PFAS

Great uncertainty among users of fluoroplastics and other modified polymers.

In cooperation with its customers, POLYTRON develops and manufactures components and systems made of so-called high-performance polymers, some of which can withstand temperatures from -270 to over +300°C, extreme mechanical loads and permanent chemical attack. Among other things, fluoroplastics (PTFE, PVDF, PCTFE...) or polymers modified with fluoroplastics are used for this purpose. These fluoroplastics are classified as per- and polyfluorinated (fully or partially fluorinated) alkyl substances (PFAS).

According to a restriction draft proposal of use, published by the European Chemicals Agency (ECHA) on February 7th, 2023, the manufacture, placing on the market (including import) and use of per- and polyfluorinated alkyl substances (PFAS) in the European Union could possibly be banned.

Below we have summarized some information and backgrounds about these substances and our products.

What are PFAS?

PFAS are industrial chemicals that, due to their special technical properties, are used in numerous industrial processes as well as in a wide range of end products. PFAS can be gaseous, liquid or solid and consist essentially of carbon-fluorine bonds (substances with a perfluorinated methyl group (-CF₃) or a perfluorinated methylene group (-CF₂-)). Carbon-fluorine bonds are among the strongest in organic chemistry and are therefore difficult to degrade, but also extremely durable.

PFAS differ in their structure, differentiated properties and large number of compounds. In total, it is assumed that there are up to 10,000 different substances. PFAS can be broadly divided into two categories: high-molecular (polymers) and low-molecular substances.

Low-molecular-weight PFAS (non-polymers)

Low-molecular-weight PFAS are contained in many additives, extinguishing agents, cleaning agents and coolants and, above all, precursors for other chemical compounds. They are divided into per- and polyfluorinated alkyl compounds. Well-known representatives of non-polymer PFAS are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), which are already banned. Many of these substances are difficult to degrade and have been detected in the environment, in the food chain and in humans, where they have usually been used on a large scale, e.g. as extinguishing agents. The mentioned substances PFOA and PFOS have been proven to be harmful to the environment and have a negative impact on health.

High-molecular-weight PFAS (polymers and elastomers)

High-molecular-weight PFAS are long-chain, polymeric compounds. Part of this group are the fluoroplastics (PTFE, PVDF, PCTFE...), the fluoro-elastomers (FKM, FFKM, FVMQ, etc.), the perfluoropolyether (PFPE), which are often used as lubricants, and so-called side-chain fluorinated polymers (SCFP), which are mostly used for repellent coatings.

Fluoroplastics (PTFE, PVDF, PCTFE...) consist of a carbon chain with directly bonded fluorine atoms. The chemical stability of these compounds prevents them from decomposing into toxic substances. A large proportion of fluoroplastics therefore meet the OECD criteria for "Products of low Concern", which are considered non-toxic, non-bioavailable and non-water-soluble and therefore have no significant impact on the environment or humans. However, low-molecular-weight PFAS may be used as reaction aids or starting agents in the production of fluoroplastics.

Perfluoropolyether (PFPE) are low-viscosity polymers that, like fluoroplastics, have a very stable chemical bond and are therefore very inert. They are widely used as lubricants and are also used for tribological modification of other plastics. Here, the smallest amounts (< 1%) are often sufficient to produce corresponding effects.

Polymers with fluorinated side chains, in contrast to PFPE and fluoroplastics, consist of a carbon chain in which the fluorine atoms are not bonded directly, but via a side chain. As a result, these polymers are less stable compared to fluoroplastics. There is a risk of loss of the side chains. Typical applications for these polymeric PFAS are impregnated papers.

Overview of per- and polyfluoroalkyl substances (PFAS)	
Non-polymers (low molecular weight PFAS)	Polymers (high-molecular-weight PFAS)
<p>per-fluorinated alkyl substances</p> <ul style="list-style-type: none"> Perfluoroalkyl acids (PFAA) Perfluoroalkyl etheric acids (PFEA) <p>poly-fluorinated alkyl substances</p> <ul style="list-style-type: none"> Fluorotelomeres Perfluoroalkane sulfonamido compounds 	<p>Fluoroplastics (PTFE, PVDF, PCTFE ...)</p> <p>Fluoro elastomers (FKM, FFKM, FVMQ ...)</p> <p>Perfluoropolyether (PFPE)</p> <p>Side-chain fluorinated polymers</p>

Restriction proposal

Many of the substances proposed for a ban are needed in key technologies. Without PFAS, the technologies needed to transform the economy cannot be produced and thus the energy and mobility transition cannot be implemented, the trade associations warn. Even lithium-ion or hydrogen technologies are dependent on PFAS, especially since these are often used in cross-sectional technology, such as tubing- (sealing) or cable-systems (insulation). The substitution of PFAS is currently unthinkable in many cases due to the property profile. PFAS are so outstanding because they combine insulation-, sliding- and friction-properties as well as media- and temperature-resistance.

For plastics, the proposed ban is even less understandable, since fluoroplastics (PTFE, PVDF, PCTFE...) meet the current OECD criteria for "Products of low Concern" (see above). Due to their insulation-, sliding- and friction-properties as well as their media- and temperature-resistance, many of the plastics concerned are indispensable and of great importance for innovative technologies, especially in the aerospace-, food- and packaging-industries, biotechnology, pharmaceutical and medical technology as well as the semiconductor, solar and electrical industries.

On September 21, 2023, the six-month consultation period on the PFAS restriction proposal in the evaluation process of the European Chemicals Agency (ECHA) expired. Information on this can be found on ECHA's website under www.echa.europa.eu.

The first results from the evaluation process are expected from ECHA in the third quarter of 2024. Only then will it be possible to predict whether the ban proposal will be followed or – as demanded by the associations and institutions – whether a more differentiated proposal will be submitted to the EU Commission for a decision.

PFAS at POLYTRON

The extent to which low-molecular-weight PFAS are used in the supply chain cannot currently be assessed with sufficient accuracy due to the large number of substances and the complexity of the production processes. Neither at POLYTRON nor at the direct suppliers these substances are intentionally added!

High-molecular-weight PFAS are used as fluoroplastics at POLYTRON to produce engineering systems and components. They are used either as pure plastics (PTFE, PVDF, PCTFE ...) or as tribological additives in other plastics. A list of the fluoroplastics used or plastics with fluoroplastic additives is annexed to this information. Together with the chemical industry, POLYTRON is already looking for PFAS-free alternatives.

Regardless of any PFAS ban, however, the majority of the plastics used by POLYTRON do not contain PFAS according to the recipe.

Quick Overview

- According to the current state of knowledge, the majority of the plastics used by POLYTRON do not contain PFAS.
- Fluoroplastics (PTFE, PVDF, PCTFE ...) belong to the high-molecular PFAS and would be affected by a possible PFAS ban.
- Depending on the filler (e.g. PTFE), tribologically modified (slip-modified) plastics may be affected by a possible PFAS ban.
- POLYTRON already offers PFAS-free alternatives.

Note: The presence of ubiquitous traces of undesirable substances can never be ruled out. Since POLYTRON has no influence on the use of products with the above-mentioned substances, we do not assume any guarantee or liability, either express or implied, in connection with the use of this information.

If you have any questions, please do not hesitate to contact us!

Attachment:

List of fluoroplastics used or plastics with fluoroplastic additives.

Standard Designation	Brand Name	PFAS type
POM C-TF	Acetron® C-TF	POM with high-molecular-weight PFAS additive
POM H-TF15	Acetron® H-AF	POM with high-molecular-weight PFAS additive
PTFE-CM	Fluoroloy® H	Fluoroplastic (PTFE)
PTFE-MI FG	Fluorosint® 207	Fluoroplastic (PTFE)
PTFE-MI	Fluorosint® 500	Fluoroplastic (PTFE)
PTFE-MI mod	Fluorosint® HPV	Fluoroplastic (PTFE)
PTFE-CF	Fluorosint® MT-01	Fluoroplastic (PTFE)
PTFE-C	HS 22232	Fluoroplastic (PTFE)
POM C-AF/TF	iglidur® J	POM with high-molecular-weight PFAS additive
POM C-TF J4	iglidur® J4	POM with high-molecular-weight PFAS additive
PEEK-TF10/CF10/GR10	Ketron® HPV	PAEK with high-molecular-weight PFAS additive
PEEK-TF10 FG	Ketron® TX	PAEK with high-molecular-weight PFAS additive
PEEK-AF/TF	Ketron® TXR	PAEK with high-molecular-weight PFAS additive
PA 6.6-GF/TF/HS	Luvocom® 1-0935-3	PA with high-molecular PFAS additive
PEK-CF/TF	Luvocom® 1114-0717	PAEK with high-molecular-weight PFAS additive
PA 6.6-TF10	Nylatron® NSB	PA with high-molecular PFAS additive
PEKK-TF10/CF10/CS10	OxPEKK® C-BG	PAEK with high-molecular-weight PFAS additive
ECTFE	POLYTRON ECTFE 1000	Fluoroplastic (ECTFE)
ETFE	POLYTRON ETFE 1000	Fluoroplastic (ETFE)
PCTFE	POLYTRON PCTFE 1000	Fluoroplastic (PCTFE)
PEEK-TF10/CF10/CS10	POLYTRON PEEK HPV	PAEK with high-molecular-weight PFAS additive
POM C-PE/TF	POLYTRON POM LXV	POM with high-molecular-weight PFAS additive
PTFE	POLYTRON PTFE 1000	Fluoroplastic (PTFE)
PTFE 59GGM3	POLYTRON PTFE 59GGM3	Fluoroplastic (PTFE)
PTFE-BR15	POLYTRON PTFE B15	Fluoroplastic (PTFE)
PTFE-BR60	POLYTRON PTFE B60	Fluoroplastic (PTFE)
PTFE-BR55/MO5	POLYTRON PTFE BM555	Fluoroplastic (PTFE)
PTFE-BR65/MO5	POLYTRON PTFE BM655	Fluoroplastic (PTFE)
PTFE-C10	POLYTRON PTFE C10	Fluoroplastic (PTFE)
PTFE-C10 (E-Carbon)	POLYTRON PTFE C10 AST	Fluoroplastic (PTFE)
PTFE-C15	POLYTRON PTFE C15	Fluoroplastic (PTFE)

Standard Designation	Brand Name	PFAS type
PTFE-C15 (E-carbon)	POLYTRON PTFE C15 AST	Fluoroplastic (PTFE)
PTFE-C25	POLYTRON PTFE C25	Fluoroplastic (PTFE)
PTFE-C25 (E-Carbon)	POLYTRON PTFE C25 AST	Fluoroplastic (PTFE)
PTFE etched on one side	POLYTRON PTFE etched	Fluoroplastic (PTFE)
PTFE-CS15	POLYTRON PTFE G15	Fluoroplastic (PTFE)
PTFE-GB30	POLYTRON PTFE GB30	Fluoroplastic (PTFE)
PTFE-GL10	POLYTRON PTFE GL10	Fluoroplastic (PTFE)
PTFE-GL15	POLYTRON PTFE GL15	Fluoroplastic (PTFE)
PTFE-GL20	POLYTRON PTFE GL20	Fluoroplastic (PTFE)
PTFE-GL25	POLYTRON PTFE GL25	Fluoroplastic (PTFE)
PTFE-PI	POLYTRON PTFE P84	Fluoroplastic (PTFE)
PTFE-PES25	POLYTRON PTFE PES25	Fluoroplastic (PTFE)
PTFE-VA50	POLYTRON PTFE VA50	Fluoroplastic (PTFE)
PTFE mod.	POLYTRON TFM 1600	Fluoroplastic (PTFE)
PTFE mod. GL25	POLYTRON TFM 4105	Fluoroplastic (PTFE)
PPS-TF	POLYTRON ZX 530	PPS with high-molecular PFAS additive
PTFE FG	Rulon® 641	Fluoroplastic (PTFE)
PTFE GP	Rulon® LR	Fluoroplastic (PTFE)
PTFE DWGV	Rulon® W2	Fluoroplastic (PTFE)
PTFE-MI ESD	Semitron® ESD 500HR	Fluoroplastic (PTFE)
PPS-TF/CF/CS	Techtron® BG	PPS with high-molecular PFAS additive
PPS-GF10/TF10	Techtron® HPV	PPS with high-molecular PFAS additive
PET-TF	Teratron™ HPV	PET with high-molecular-weight PFAS additive
PAI injection molded	Torlon® 4203	PI with high-molecular PFAS additive
PAI-CS12	Torlon® 4301	PI with high-molecular PFAS additive
PA-CS20	Torlon® 4275	PI with high-molecular PFAS additive
PAI-CF10/CS15/TF5/MI5	Torlon® 4435	PI with high-molecular PFAS additive
PAI-CS/TF	Torlon® 4630	PI with high-molecular PFAS additive
PI-CS15/TF10	Vespel® SP-211	PI with high-molecular PFAS additive
PEEK-TF10	Victrex® PEEK TF10	PAEK with high-molecular-weight PFAS additive

Note: All recommendations, information and data made by or on behalf of POLYTRON Kunststofftechnik can be regarded as reliable. POLYTRON Kunststofftechnik assumes no liability whatsoever for the application, use, processing or other use of the products and the associated recommendations, information or for the resulting consequences. The plastics offered by POLYTRON Kunststofftechnik are not suitable for use in or on medical or dental implants!