

A Balanced Case for Fluoropolymers

8 September 2025

Fluoropolymers

 Product Group of Plastics Europe

Webinar Agenda

- **About FPG** – Caroline Andersson
- **The PFAS Restriction: Setting the Scene** - Ronald Bock
- **The FPG Manufacturing Programme and Other Initiatives** – Dries Maebe
- **Moderated Q&A**

Please note:

- The **Q&A** at the end of the event is with written questions only. Please share your questions for us via the Zoom Q&A tab. Make sure to also include your name and organisation with us – We will try to answer as many questions as possible.
- This audience includes the entire value chain and is the ideal platform to share evidence, listen, and engage constructively.
- The webinar is not being recorded.
- This presentation will be sent to all registrants.



Fluoropolymers

 Product Group of Plastics Europe

About FPG

Caroline Andersson
FPG Director

About FPG

Fluoropolymers

Product Group of Plastics Europe

The **Fluoropolymers Product Group (FPG)** represents Europe's leading fluoropolymer producers and experts

We are the voice of the industry calling for responsible manufacturing, sustainable life cycle management and regulatory clarity.

We are a **Product Group of Plastics Europe**, headquartered in Brussels.

We ensure that fluoropolymers can continue to play their vital role in enabling innovation and sustainability across key industries, including healthcare, renewable energy, semiconductors, transportation and more.



The FPG Members are:

AGC

ARKEMA

Chemours

DAIKIN

DUPONT

GFL
GUJARAT FLUORO-CHEMICALS
TRUST THROUGH GREEN CHEMISTRY

GORE

Honeywell

SYENSQO
ADVANCING HUMANITY

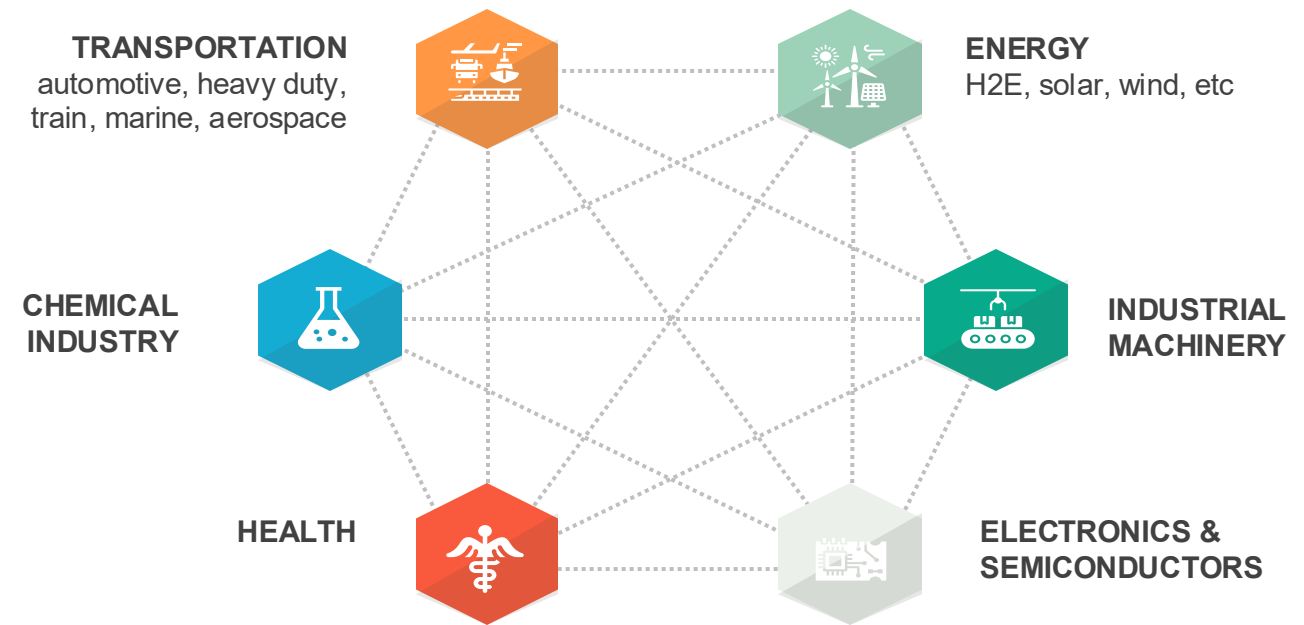
KUREHA

Properties of Fluoropolymers

- **Fluoropolymers are advanced polymers** known for their unique chemical and thermal resistance properties used in various industries.
- **They differ fundamentally from other PFAS** due to their unique properties and safety profile when used responsibly.
- **They are chemically inert**, non-mobile, not water-soluble, and non-bioavailable. They remain stable under high temperatures and extreme environmental conditions.
- **They are high performance materials**, essential to many critical applications in a broad range of industrial, commercial and consumer uses.
- **They cannot be substituted** without compromising safety and performance.
- **They are responsible, safe and durable** by design.

Benefits of Fluoropolymers

- Fluoropolymers play a strategic role in strengthening Europe's economy and autonomy.
- Europe is a net exporter of fluoropolymers. The value of fluoropolymers sold in the EEA in 2022 was €1 – 3 billion.
- They are used in almost all sectors.



Sectors are often interconnected

Examples of Societal and Environmental Value

- **Durability and Efficiency:** Extend product lifespans, reduce maintenance, and lower energy consumption, contributing to sustainability goals.
- **Climate Goals:** Their role in clean energy technologies (e.g., hydrogen, batteries) supports EU climate ambitions
- **Health:** Ideal for medical devices because they are non-reactive with human tissue, making them safe for use in implants and catheters. They don't trigger immune responses or degrade inside the body, which is crucial for long-term medical applications.
- **Safety :** Their unique chemical and physical properties make them ideal for demanding environments where reliability, durability, and non-reactivity are critical.



Aerospace



Automotive



Chemical and power



Electronics



Pharmaceutical



Medical equipment



Architecture



Renewable energy



Water

The PFAS Restriction: Setting the Scene

Ronald Bock

FPG Chair

AGC Director of Governmental Affairs

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Overview of Global Regulatory Environment

Group-Based Approach	Countries or jurisdictions moving towards regulating all PFAS as a group and influencing others to do so	
Focused Approach	Countries that have proposed a measured approach to regulating a broad group of PFAS	 
Mixed Approach	Countries with regulatory landscapes defined by a fragmented set of regulations	
Emerging Regulation	Countries with nascent regulatory frameworks that have shown interest / potential in regulating a broad group of PFAS	

International Environmental Agreements such as the Stockholm Convention are both influenced by national actions and result in them.

The PFAS REACH Restriction

- On February 7th, 2023, the European Chemical Agency (ECHA) published a regulatory proposal to restrict the manufacture, placing on the market and use of all PFAS in the EU, following the proposal from Denmark, Germany, The Netherlands, Norway and Sweden.
- **The restriction covers over 10,000 PFAS substances across 14 sectors and was expanded to include 8 additional sectors in the updated Background Document received by ECHA on 24 June 2025.**
- **On 20 August 2025**, ECHA published an update for the Restriction Dossier - the **Background Document**.

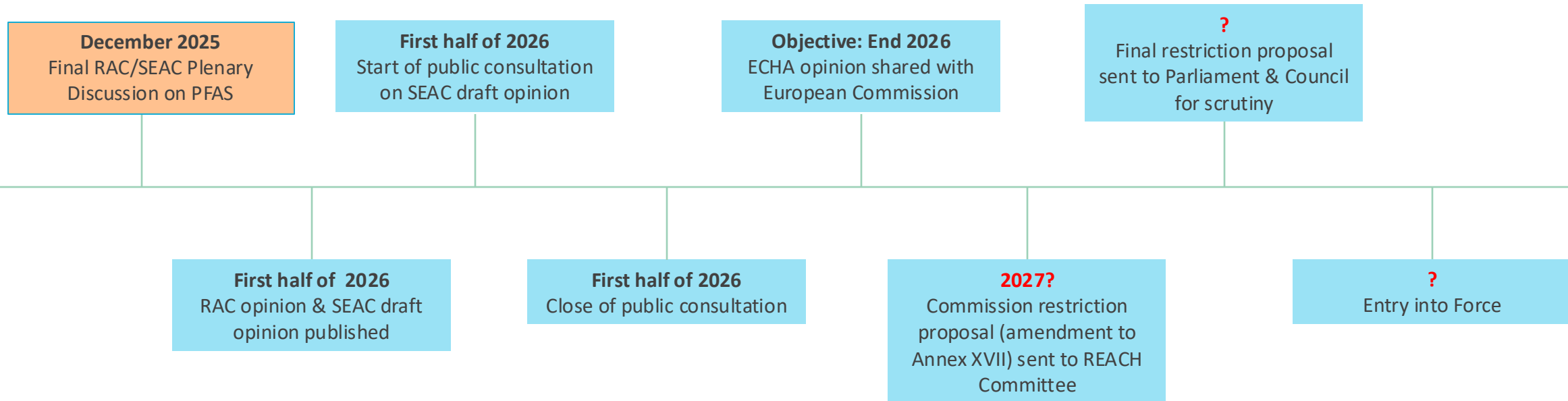
This is the Dossier Submitters' update to the initial restriction proposal.

- <https://www.echa.europa.eu/hot-topics/perfluoroalkyl-chemicals-pfas>
- <https://echa.europa.eu/hot-topics/perfluoroalkyl-chemicals-pfas>

Next steps:

- ECHA's assessment of the restriction is ongoing and scheduled to conclude at end of 2026.
- A consultation on the draft SEAC opinion is expected to begin in the first half of 2026, following the release of the RAC opinion and SEAC draft opinion. The consultation will focus on the socio-economic impacts of the proposed PFAS restriction, including job losses, substitution challenges, and data gaps.
- The European Commission is committed to presenting a proposal **as soon as possible** after receiving ECHA's opinion.
- **The consultation is expected to run for 2 months.** Industry stakeholders have requested more than the 60-day window due to the complexity and volume of the background documentation.

Possible Restriction Timeline



The Background Document

The Draft Background Document is not the final restriction and may be further amended by RAC and SEAC.

- The EU PFAS restriction under REACH poses concerns due to its lack of differentiation between fluoropolymers and other PFAS substances.
 - FPG recognises the efforts made by the dossier submitters in reviewing and integrating new data and scientific evidence from the public consultation.
 - This approach reflects the voluntary manufacturing programme set forward by FPG.
 - FPG welcomes the recognition of fluoropolymers' critical uses and their significant socio-economic benefits.
- In the document, the authorities are proposing extensive derogations for the manufacturing of fluoropolymers, providing operations are under controlled conditions. These other options are explained in the Appendix of the presentation, which you will receive after this event.
 - However, a full exemption for fluoropolymers under REACH is justified for scientific, environmental and economic reasons, and the EU's Simplification Omnibus initiative.

Chemicals Industry Action Plan (CIAP)

The chemicals Industry Action Plan (CIAP), was published on 8 July 2025 by the European Commission to outline their vision for addressing the challenges confronting one of the continent's **most vital economic sectors**: the Chemicals Industry.

- Fluoropolymers are acknowledged to currently be **irreplaceable in critical applications** - enabling Europe's digital and ecological transitions and reinforcing its strategic autonomy. The Commission indicates support for exemptions where substances are essential to these goals: in most such cases, the materials in question are fluoropolymers.
- Regulatory concerns predominantly relate to emissions during manufacturing and end-of-life stages. Therefore, continued use of fluoropolymers in all applications should be allowed under conditions aimed at minimising emissions throughout the whole life cycle, as alternatives with the same performance and safety do not exist.
- With this in mind FPG calls on the European Commission to apply a **risk-based, differentiated approach**. Fluoropolymers, which are a distinct class of PFAS and do not pose an “unacceptable risk” to the environment and human health (REACH, Article 68).
- [Read full FPG statement here.](#)

Proposal for a Full Exemption of Fluoropolymers

- The intrinsic properties, related safety profile of fluoropolymers and their socio-economic value should mean that they are differentiated from other PFAS. The Draft **Background Document already** explores alternative restrictions for fluoropolymers.
- Concerns raised in relation to the fluoropolymer lifecycle are being addressed:
 - The Manufacturing Programme, including impressive emission reductions, a state-of-the-art emissions management technology exchange platform and the Safe Handling Guide
 - Major study on fluoropolymer end of life, including fluoropolymer circularity and new evidence on safe incineration of fluoropolymers.
 - Work with our value chain partners to pursue alternative risk management approaches e.g. Industrial Emissions Directive and Waste Framework Directive
- FPG advocates that to ensure predictability for future use, security of supply, future innovation and investment in Europe in these strategic materials a full exemption is warranted
- **The upcoming SEAC consultation is an important moment to make this point.**
- [Read full FPG statement here.](#)

Key Takeaways

- FPG is committed to an open, science-based debate with regulators, policymakers, downstream users, and civil society, ensuring decisions are grounded in evidence.
- Restricting fluoropolymers would undermine the EU's industrial resilience, competitiveness, and Green Deal goals, with severe socio-economic impacts.
- The right way forward is a differentiated, risk-based regulatory approach that safeguards sustainability, innovation, and competitiveness together.
- A full exemption for fluoropolymers under REACH is warranted.

How can we work together to protect the use of fluoropolymers

- Submit your expertise to the upcoming SEAC consultation
- Collect experiences with lack of substitutions and alternatives
- Compile clear data on how your products are essential and how sectors are interconnected
- Share this knowledge in your communications
- FPG will host a webinar next year on what & how to input to the consultation.
- Contact caroline.andersson@plasticseurope.org to discuss how we can work together.

The FPG Manufacturing Programme pillars, achievements, and other initiatives

Dries Maebe

FPG Management Committee Member

Head of Chemical and Environmental
policy EMEA

Fluoropolymers

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FPG Priorities: A Responsible Industry

FPG and its members are committed to the safe use and sustainable manufacturing of fluoropolymers, as well as to responsible end-of-life solutions.

- **Voluntary Emissions Reductions**

FPG members have initiated a manufacturing programme to reduce emissions to water and air of non-polymeric PFAS residues from polymerization aid technology. It is a new benchmark for emissions control in Europe.

- **Safe Handling Guide:**

An updated and comprehensive guide for the safe handling of several fluoropolymers has just been published and is available for free from the FPG website www.fluoropolymers.eu.

- **Investment in Circularity:**

The industry is actively investing in end-of-life solutions, including safe disposal and circular use of fluoropolymers.

The Manufacturing Programme - Commitments

- Launched in 2023, the programme sets a new benchmark for emissions control in Europe with early target achievements.
- This initiative is designed to tackle valid inquiries and worries regarding emissions produced in the manufacture of fluoropolymers

Three Core Pillars:

- **Reduce non-polymeric PFAS emissions** from fluoropolymer manufacturing
- **Technology Exchange Platform** – sharing best practices across the industry & key stakeholders
- **Safe Handling Guides** – enhancing workplace & environmental safety

FPG Manufacturing Programme for European Manufacturing sites

Since the 2021 adoption of the manufacturing principles, all Fluoropolymer Products Group (FPG) members are engaged in concrete actions related to fluoropolymer manufacturing practices.

The undersigned members of the Fluoropolymer Products Group (FPG) hereby commit to an industry Manufacturing Programme for European Manufacturing sites. The programme is comprised of three pillars:

1. A voluntary commitment to reduce non-polymeric PFAS emissions from our fluoropolymer manufacturing;
2. A platform to promote the adoption of commercially available state of the art technologies to minimise non-polymeric PFAS emissions in our manufacturing; and
3. A commitment to inform downstream users of fluoropolymers on their safe handling and use.

1. Voluntary commitment on non-polymeric PFAS emissions reduction

The voluntary commitment focuses on the emission reduction of non-polymeric PFAS chemicals from European fluoropolymer manufacturing.

The undersigned PE-FPG members commit for their European Fluoropolymer manufacturing sites to:

- Achieve the following Average Emission Factors of non-polymeric PFAS residues from polymerisation aid technology that is used in the fluoropolymer manufacturing process:
 - By end 2024: 0.009% to air; 0.001% to water
 - By end 2030: 0.003% to air; 0.0006% to water

Average Emission Factors are calculated as follows (in percentage): Annual emission of non-polymeric PFAS residue from non-polymeric polymerization aid technology [added or generated]/total annual amount of fluoropolymers produced on site.¹

The achievement of these Average Emission Factors is independent of whether fluorinated, non-fluorinated or no polymerization aids² are being used in the production of fluoropolymers, at each of our sites.

The Manufacturing Programme - Results (End 2024)

The member companies have successfully met the first reduction target for non-polymeric PFAS residues from polymerisation aid technology.

- For Air, members achieved a reduction of these emissions in their 2024 annual average emission factors below their target of 0.009% (*By end 2030: 0.003%*);
- For Water, while not all members have met the 2024 annual average emission factor for the emissions target of 0.001%, they all met that ambitious target at the end of 2024 (*By end 2030: 0.0006% to water*).

Members of the FPG Manufacturing Programme Consortium are committed to achieving the ambitious emissions reduction of the programme for 2030.

Equation 1. Calculation of emission factors

$$EF_{comp} = E_{comp} / m \times 100,$$

Where:

EF	emission factor of the produced/ processed PFASs	[%]
comp	receiving environmental compartment i.e.: water or air	[-]
E	Tonnes of PFASs emitted per year	[t/y]
m	Tonnes of PFASs produced/ processed per year	[t/y]

Reference: [Annex B to the Restriction Proposal](#) (page 227)



Supporting Documents and Evidence:

The Background Document confirmed FPG's commitments, and our evidence supports the safe fluoropolymer lifecycle management.

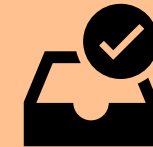
Safe Handling Guide

The **Guide for the Safe Handling of Fluoropolymer Resins** is an essential pillar of FPG's Manufacturing Programme

- **This comprehensive update**, the first of two, covers essential materials such as PTFE, ETFE, FEP, PFA, PVDF, and ECTFE, which are widely used in various industries including aerospace, transport, chemical processing, energy, medical devices, and technical clothing.
 - FPG will update this by adding the information on other fluoropolymer resins and fluoroelastomers next year.
- **It reflects current knowledge** and best practices for handling fluoropolymer resins safely, minimizing health risks and environmental impacts, and ensuring compliance with regulations across Europe and associated regions.



Interested in understanding how this updated guide can help you safely manage the handling of fluoropolymer resin?



Download your free copy from the [FPG website](#)

Ongoing initiatives:

Assessment of Alternatives (AoA)

In 2023 FPG conducted a preliminary assessment of fluoropolymers applications and potential alternatives. This was submitted to the ECHA consultation.

Across both internal and external sources, the consensus is clear: fluoropolymers possess a unique combination of properties that no other material currently matches.

- These properties are indispensable in sectors like aerospace, medical devices, electronics, and chemical processing, where alternatives can fail to meet the same standards (including higher risk of failure or contamination and lower performance).

FPG Action:

- **FPG has initiated a new, independent, scientific study focused on an in-depth evaluation of alternatives, analysing their safety, sustainability, life cycle, feasibility, and performance - to complement the already existing information.**
- Report expected Q4 2025

Ongoing initiatives:

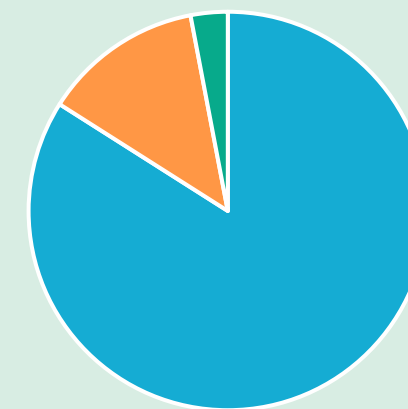
End-of-Life (EoL)

- Main concerns for fluoropolymers are PFAS emissions at manufacturing and end-of-life stages.

FPG Action:

- FPG has initiated a new study to build a comprehensive understanding of what happens in this phase at EoL.
- Focus is incineration and recyclability of fluoropolymers.
- Report expected Q4 2025

What we know about at FP at End of Life



- 84% end up in waste to energy
- 13% are landfilled
- 3% are recycled

Pro-K engaged Conversio in 2022 to develop a report on fluoropolymers at EoL. The report was submitted to the ECHA consultation in 2023

Key Takeaways

- **FPG and its members are committed to best practices** in manufacturing and end-of-life management, ensuring fluoropolymers continue to meet the highest standards of safety and environmental stewardship.
- **Restricting fluoropolymers would undermine** the EU's industrial resilience, competitiveness, and Green Deal goals, with severe socio-economic impacts.
- **FPG members are taking concrete action** and launched a voluntary emissions reduction programme, under which the members that have production sites in the EU and in the UK successfully met the agreed milestones by late 2024/early 2025. Evidence shows fluoropolymers can be managed safely across their entire lifecycle. **We continue to build on this success with determination and have launched more initiatives such as AoA and EoL.**
- **We also recently completed the update** to our Guide for the Safe Handling of Fluoropolymers (the first of two), designed to support downstream users in implementing best practices for emissions control, thus fulfilling our second commitment to the Manufacturing Programme.



Q&A

Continuing our Collaboration

- Fluoropolymers are critical for modern society.
- FPG supports evidence-based dialogue with all stakeholders.
- Fluoropolymer restrictions risk Europe's resilience and Green and Digital transitions.
- Socio-economic costs would be significant.
- A risk-based, differentiated approach is needed.
- Full REACH exemption for fluoropolymers is warranted.

- FPG and members follow best practices in manufacturing and end-of-life management.
- FPG launched a voluntary emissions reduction programme; EU/UK milestones met by early 2024.
- Fluoropolymers can be safely managed across their lifecycle.
- New initiatives underway, including AoA and EoL.
- Updated Safe Handling Guide supports downstream users in emissions control.

The SEAC consultation is a critical moment for downstream users and stakeholders to **contribute evidence** and make their voices heard.



Thank you

 Fluoropolymers Product Group

 <https://fluoropolymers.eu/>

#ChangingPlasticsForGood

Appendix

- **FPG Manufacturing Programme**
 - [FPG Statement on the Manufacturing Programme 2025 - Plastics Europe](#)
- **ECHA publication 20 August 2025, Updated PFAS restriction proposal (Draft Background Document)**
 - <https://echa.europa.eu/-/echa-publishes-updated-pfas-restriction-proposal>
- **ECHA update on the timeline for the evaluation of the proposal**
 - [6775e241-204e-af0a-a2d0-4c16ba2c138d](https://echa.europa.eu/-/echa-publishes-updated-pfas-restriction-proposal)
- **FPG Statement on ECHA's Updated PFAS Background Document**
 - <https://fluoropolymers.eu/2025/08/27/fluoropolymers-recognised-fpgs-statement-on-echas-updated-pfas-background-document/>
- **FPG Statement, call for clarity**
 - <https://fluoropolymers.eu/2025/07/10/fpg-calls-for-clarity-on-fluoropolymers/>
- **FPG Press Release on the Updated Safe Handling Guide**
 - [FPG Releases its Comprehensive Guide on Safe Handling of Fluoropolymer Resins - Plastics Europe](#)

Please note:
Alternative options proposed in ECHA's Draft Background Document are listed in the Appendix of this presentation, **which you will receive via email.**

Other options proposed in the Draft Background Document.

Fluoropolymers: A Special Case

- The document acknowledges that fluoropolymers are chemically and biologically distinct from other PFAS.
- Extensive derogations are therefore proposed for the manufacturing of fluoropolymers. However, FPG's position remains that a full exemption is warranted based on scientific evidence and strategic importance.
- Administrative burdens and regulatory complexities should also be considered regarding alternative options should also be considered regarding alternative options: For instance, requirements as proposed in paragraphs 7 and 8 are impractical and would be impossible to achieve by many SMEs and importers of PFAS-containing articles, including every item containing one or more semiconductors. Importer would be required to report all identities and volumes of any PFAS in every item.

Other options proposed in the Background Document

RO1

Full ban

- Transition period: 18 months from entry into force of the restriction

RO2

Ban with use-specific derogations

- Transition period: 18 months from entry into force of the restriction.
- Duration of derogation:
 - 5 years
 - 12 years
 - Time-unlimited derogations and long-term derogations

RO3

Additional restriction options

- Transition period:
- Applications:
 - PFAS Manufacturing
 - Transport
 - Electronics and semiconductors
 - Energy
 - Sealing applications
 - Machinery applications
 - Technical textiles

RO1: Ban on PFAS

1. [PFAS] Shall not be manufactured, used or placed on the market as substances on their own;

2. [PFAS] Shall not be placed on the market in:

- a. another substance, as a constituent;
- b. a mixture,
- c. an article

in a concentration of or above:

- i. 25 ppb for any PFAS as measured with targeted PFAS analysis (polymeric PFAS excluded from quantification)
- ii. 250 ppb for the sum of PFAS measured as sum of targeted PFAS analysis, optionally with prior degradation of precursors
- iii. 50 ppm for total PFAS (polymeric PFAS included). If total fluorine exceeds 50 mg F/kg the manufacturer, importer or downstream user shall upon request provide to the enforcement authorities a proof for the fluorine measured as content of either PFAS or non-PFAS.

RO2: Non-time limited production for fluoropolymers

Derogations for the Manufacture of Fluoropolymers

- The Background Document details specific conditions for the continued manufacture of PFAS, which includes fluoropolymers, under paragraph '4m' of the proposed restriction.
- This derogation is non-time limited and aims to allow the continued production of PFAS that are essential for derogated uses or for export outside the EEA, while strictly minimising emissions.
- The manufacturing derogation includes specific emission limits for non-polymeric PFAS residues from polymerisation aid technology in fluoropolymer manufacturing:
 - Until the end of 2030: Emissions must not exceed 0.0090% to air, 0.0010% to water, and 0% to soil.
 - From the end of 2030 onwards: Emissions must not exceed 0.0030% to air, 0.0006% to water, and 0% to soil.
 - For all other PFAS emissions not specifically mentioned above (from sites manufacturing polymeric and non-polymeric PFAS), the limit is 0.01% to all compartments 6.5 years after EiF (i.e., after the 18-month transition period plus 5 years).
- The derogation is non-time limited because manufacturing itself has no independent function, and alternatives for the act of manufacturing PFAS cannot become available over time. A time-limited derogation would inevitably lead to the closure of all manufacturing facilities in the EEA.
- The proposed emission limits are designed to ensure that emissions are minimised according to current best practices, and fluoropolymer manufacturers in the EEA have already committed to voluntarily implementing some of these measures.
- This derogation covers PFAS building blocks and intermediates necessary for the synthesis pathway of final PFAS substances used in derogated applications.

RO2: Ban with use-specific derogations

For **fluoropolymer and perfluoropolyethers**, derogations for their use are primarily found under paragraph 6 of the proposed restriction, with durations of either 5 or 12 years after the 18-month transition period.

5 Year Derogations

- Polymer processing aids used in flexible plastic film extrusion (for food and non-food applications) (§6a)
- Non-stick coatings in industrial bakeware (§6b)
- Separator coatings for batteries (§6l)
- PTFE (Polytetrafluoroethylene) nozzles in high voltage (>145 kV) switchgears and circuit breakers (§6m) Front- and backsheets in photovoltaic cells (§6n)
- Blisters for solid oral dose formulations (§6s)
- Industrial use of fluoropolymers in filtration and separation media for water treatment and purification (§6y)

12 Year Derogations

- | | |
|---|---|
| <ul style="list-style-type: none"> • Implantable medical devices (including medical implants and meshes) (§6c) • Invasive medical devices (e.g. tubes and catheters) (§6d) • Packaging for medical devices (§6e) • Vehicle systems, components or separate technical units (subject to EU vehicle type approval) and Systems, components or separate technical units (not subject to EU vehicle type approval but where fluoropolymers/PFPEs are strictly necessary for safety or environmental performance) (§6f) • Heat transfer fluids for industrial and professional use of vapor phase soldering for electronics (§6g) • Wires and cables (incl. connectors) (§6h) • Insulation material of electronic components (excluding wires, cables and connectors) (§6i) • Anti-drip agent in plastics of electronic components (§6j) • Fuel cells and electrolyzers (§6k) | <ul style="list-style-type: none"> • Bridge and building bearings (§6o) • Sealing applications in industrial uses (§6p) • Machinery applications in industrial uses (§6q) • Coatings in release liners and backing film in transdermal patches (§6r) • Coated rubber stoppers in vials/flasks for injectable medicinal products (§6t) • Coated canisters in pressurized metered-dose inhalers (pMDIs) (§6u) • Coated plungers in pre-filled syringes (§6v) • Pre-filled injection pens & autoinjectors (§6w) • Explosives in military applications (§6x) |
|---|---|

RO3: Additional Restriction Options

- In addition, ECHA have considered alternative restriction options, beyond a full ban or a ban with time-limited derogations for certain applications.
- These were developed based on comments received during the consultation on the Annex XV report. These options were designed to allow for the continued use of PFAS under strict conditions that minimise emissions over the full life-cycle.
- The alternative options have been assessed by the Dossier Submitter for:
 - PFAS manufacturing (see previous slide);
 - transport;
 - electronics and semiconductors;
 - energy;
 - sealing applications;
 - machinery applications; and
 - technical textiles.
- **Management plans and reporting requirements** are integral to the **RO3** framework and are also requirements attached to use-specific derogations under **RO2**.
- These measures are designed to ensure that the continued use of Per- and polyfluoroalkyl substances (PFAS) occurs under **strict conditions that minimise emissions over the full life cycle**.