# Réunion PFAS
# DGE

22 février 2023

FRANCE CHIMIE

PLASTICS EUROPE
Enabling a sustainable future
Fluoropolymers Product Group

PFA FILIÈRE AUTOMOBILE & MOBILITÉS

# Rappel : respect du droit de la concurrence

Les participants à la réunion s'interdisent d'échanger ou de communiquer des informations susceptibles de constituer une infraction au droit de la concurrence.

Est plus particulièrement prohibé le fait de :

- Echanger sur les coûts, prix et délais de paiement pratiqués par une entreprise ;
- Echanger sur des données de production (volumes, investissement, distribution, capacités de stocks, etc.) relatives à une entreprise ;
- Echanger des informations relatives à la politique commerciale d'une entreprise (politique tarifaire, tarif transport, offre contractuelle, liste de clients ou fournisseurs, etc.) ou à la politique salariale ;
- Boycotter ou inciter au boycott d'une entreprise.

Tout participant estimant que certains propos tenus en séance constituent une entorse à cette règle déontologique interpelle immédiatement l'assemblée afin qu'il soit mis fin au trouble causé. Tout participant est en droit de faire interrompre la séance et de quitter la réunion si le sujet est poursuivi.

# Participants

- - ARKEMA
- – PLATEFORME AUTOMOBILE
- - SOLVAY
- – FLUOROPOLYMERS GROUP
- – FRANCE CHIMIE
- - FRANCE CHIMIE

# Agenda

- Le monde des PFAS et leurs utilisations
- La restriction européenne
- L'impact de la restriction sur:
  - Les fabricants de PFAS
  - Un des secteurs utilisateurs de PFAS

# Points abordés

1. About the fluoropolymer products group
2. Fluoropolymers enabler of Green deal and used in cutting-edge economic sectors
3. Overview of the proposed PFAS restriction
4. All PFAS are not the same

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# 1. About the fluoropolymer products group

# The Fluoropolymers Product Group (FPG)

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

As the voice of the industry across Europe, the Fluoropolymers Product Group advocates for a balanced regulatory environment based on scientific facts to ensure that European industries remain competitive and sustainable.

Part of PlasticsEurope, the group's members are **3M, AGC, Arkema, Chemours, Daikin Chemicals, DuPont, Gujarat Fluorochemicals, Honeywell, W. L. Gore & Associates, and Solvay**.

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# 2. Fluoropolymers enabler of Green deal and used in cutting-edge economic sectors

# Irreplaceable fluoropolymers

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## ONE-OF-A-KIND POLYMERS

Fluoropolymers are unique chemical substances used across numerous technologies, industrial processes and everyday applications from the aviation industry to transportation, medical devices and energy production and technical apparel.

With a unique set of properties, they are durable, chemically inert and mechanically strong. Fluorpolymers help to keep us safe and enable innovation.

## WHY DO WE USE FLUOROPOLYMERS?

- Ensure , reliability and performance across a variety of sectors
- Low-risk polymer for human health & environment
- Help drive EU industry competitiveness and innovation
- Critical to numerous technologies enabling the Green Deal, reducing waste and emissions
- Few, if any, viable alternatives


## Uses of fluoropolymers

- Promoting sustainable and smart mobility through electric vehicles.
- Extending the lifespan of medical equipment and devices, reducing the need for replacements, risk of failure and cross infections.
- Enabling a data driven economy though the manufacturing of microprocessors and semi-conductors.
- Facilitating the Renovation Wave and the construction of energy efficient buildings.
- Driving innovation and helping decarbonise the aviation industry.
- Assisting the chemicals industry in preventing corrosion in harsh environments.
- Ensuring food and pharmaceuticals remain fresh and uncontaminated.
- Protecting workers in professional protective and high-performance clothing.

# 3. Overview of the proposed PFAS restriction

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# Overview of the proposed PFAS restriction

- Since 2020, the competent authorities of the five countries (Germany, Netherlands, Sweden, Norway, Denmark) have been preparing a REACH restriction dossier for all PFAS. The restriction proposal was submitted to ECHA on 13 January, 2023;
- REACH restriction “is considered to be the most effective and efficient way to manage such a large and complex group of substances that are used in numerous applications.” The restriction would cover PFAS manufacturing, use, and placement on the EU market;
- They argue that the persistence of all PFAS poses an unacceptable risk to the environment and humans;
- The competent authorities intend to make no differentiation between different types of PFAS and their toxicological profiles.

# Overview of the proposed PFAS restriction

- **PFAS definition** (in the restriction proposal): Any substance that contains at least one fully fluorinated methyl (CF3-) or methylene (-CF2-) carbon atom (without any H/Cl/Br/I attached to it).
- **PFAS shall not be manufactured, used or placed on the market as substances on their own.**
- **The five competent authorities considered:**
  - RO1: Ban of PFAS with 18 months transition period
  - RO2: Ban of PFAS in some applications with derogation of 5 or 12 years (+18 months)
- If a derogation is not granted, industry has 18 months for transition after Entry Into Force (EIF) EIF is expected Q3/Q4 2025-Q1/Q2 2026

# Overview of the proposed PFAS restriction – Sectors

- The following sectors are considered in the PFAS REACH restriction proposal.

| PFAS sectors/applications | | | |
|---|---|---|---|
| PFAS manufacture | Textile, upholstery, leather, apparel and carpets (TULAC) | Food contact materials and packaging | Metal plating and manufacture of metal products |
| Consumer mixtures | Cosmetics | Ski wax | Applications of fluorinated gases |
| Medical devices | Transport | Electronics and semiconductors | Energy sector |
| Construction products | Lubricants | Petroleum and mining | |

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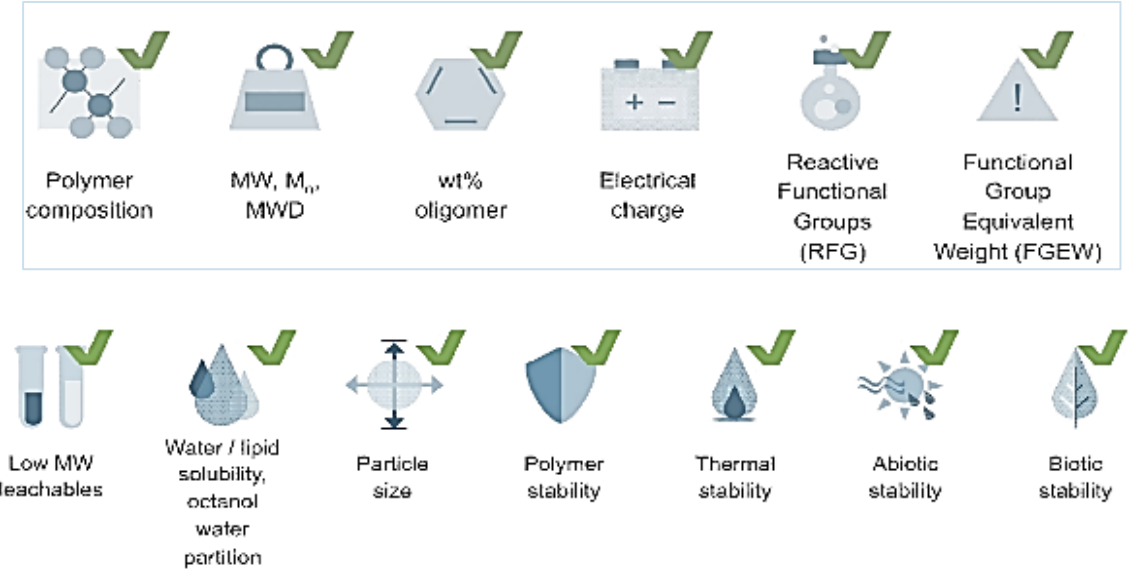
# 4. All PFAS are not the same

# How are Fluoropolymers Different to Other PFAS

- Per- and polyfluoroalkyl substances (PFAS) are a **huge and diverse group** of chemical compounds.
- **Despite their chemical structure, fluoropolymers are different to other PFAS** and have specific toxicological and environmental profiles.
- **96% of the global commercially fluoropolymers meet the OECD polymers of low concern (PLC) criteria**. They possess distinct physical, chemical and biological properties and **should not be grouped with other PFAS for hazard assessment or regulatory purposes.**
- **Fluoropolymers that meet the OECD PLC criteria** are non-toxic, bio-compatible, non-soluble and immobile molecules and they are deemed as such to have **insignificant environmental and human health impacts**.

# Scientific Study: Fluoropolymers are Polymers of Low Concern (PLC)

OECD Polymer of Low Concern (PLC) criteria were created to facilitate polymer hazard assessment that identifies low risk polymers that in turn assists in prioritizing regulatory activity on high-risk substances.



# Grouping of PFAS – A View from the Scientific Community

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A panel of leading PFAS scientific experts convened to provide insight and guidance on PFAS grouping for the purposes of protecting human health. Most of them agreed that “all PFAS” should not be grouped together for risk assessment purposes, that persistence” is not sufficient for grouping PFAS for the purposes of assessing human health risk, agreed that it is inappropriate to assume equal toxicity/potency for PFAS without confirmatory information.

## Challenges on grouping

- No global harmonized definition of PFAS exists, which is problematic for risk assessment purposes.
- Toxicity, bioaccumulation, toxicokinetics, and exposure profiles could vary among PFAS. Those characteristics should be considered when assessing human health risk. Similarly, grouping all PFAS together as “persistent” is not supported as practical nor appropriate for assessing human health.
- Most PFAS risk assessments will need to employ substantial assumptions and defaults. These assumptions are often multiplicative and can lead to overestimates of both potency and exposure, and therefore, over-regulation.

Grouping of PFAS for human health risk assessment: Findings from an independent panel of experts - Regulatory Toxicology and Pharmacology, Volume 134, October 2022.

A Critical Review of the Application of Polymer of Low Concern Regulatory Criteria to Fluoropolymers II: Fluoroplastics and Fluoroelastomers - Society of Environmental Toxiology and Chemistry, 9 June 2022

Reconciling Terminology of the Universe of Per- andPolyfluoroalkyl Substances: Recommendations and Practical Guidance – OECD - Series on Risk Management – Number 61, 2021

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# THE FLUOROPOLYMER PRODUCTS GROUP COMMITS TO RESPONSIBLE MANUFACTURING PRINCIPLES

The fluoropolymer industry, represented by the **PlasticsEurope Fluoropolymer Products Group**, is committed to develop and implement innovative solutions to minimize the environmental footprint associated to fluoropolymer production and to reduce their potential emissions, based on the Best Available Techniques (BATs).

The fluoropolymer industry has adopted and will continue to develop new technologies and to invest in R&D to reach this goal. Therefore, the Fluoropolymer Products Group member companies commit voluntarily to the following **responsible manufacturing principles.**

## FPG'S PRINCIPLES

### 1 BEST AVAILABLE TECHNIQUES

Continue to maintain, improve and/or develop Best Available Techniques in the manufacturing processes and management of environmental emissions related to fluoropolymers.

### 2 CONTAINMENT, CAPTURE & RECYCLE TECHNOLOGIES

Continuously improve and develop containment, capture, and recycle technologies to minimize emissions into the environment from PFAS substances intentionally and non-intentionally present in fluoropolymers including fluorinated raw materials, polymerization aids, monomers, intermediates, and process chemicals as well as by-products.

### 3 SAFE SUBSTITUTION OF PFAS-BASED POLYMERIZATION AIDS

Intensify our efforts to investigate and develop R&D programs for the advancement of technologies for the replacement of PFAS-based polymerization aids during fluoropolymer production. Where proven technically feasible, environmentally sound, and viable at an industrial and commercial scale, FPG commits to replace the use of PFAS as polymerization aids.

### 4 ENHANCED RECYCLABILITY AND REUSABILITY

Continue to proactively work with its downstream users to increase recyclability and reuse of its products and develop R&D programs in line with the objectives of a circular economy.

### 5 ENSURE WORKERS MINIMAL EXPOSURE TO CHEMICALS

Continue to minimize the exposure levels for workers to chemicals used in the fluoropolymers manufacturing process.

### 6 MONITOR COMMITMENTS THROUGH THIRD-PARTY ASSESSMENT SYSTEMS

Introduce or expand already existing third-party assessment programs to help verify progress in members' commitments.

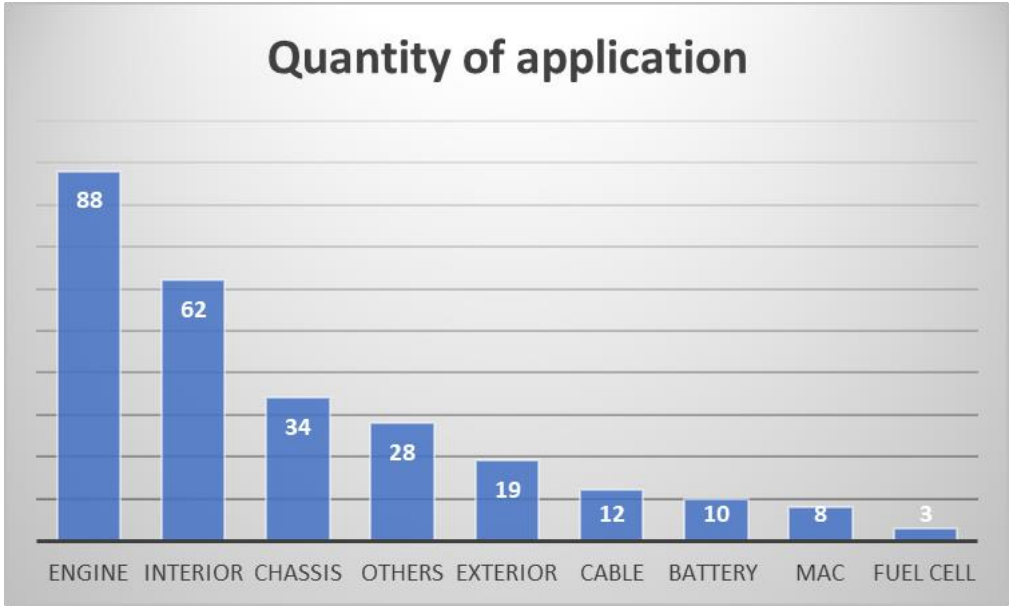
## FPG COMMITMENTS

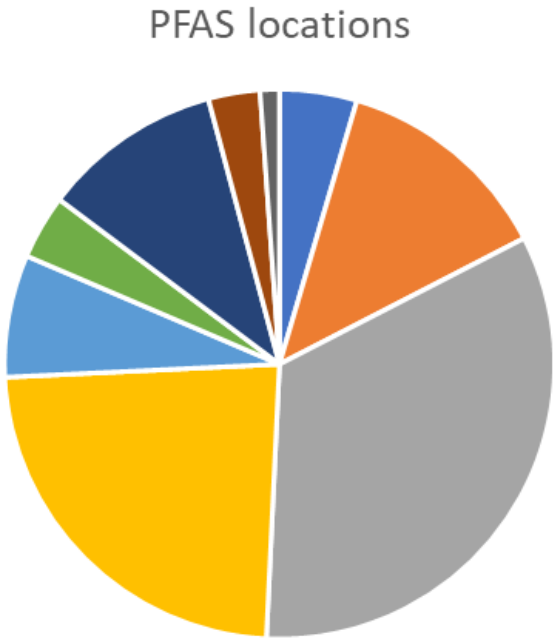
Each member company takes actions to implement these responsible manufacturing principles. In addition, the Fluoropolymer Products Group members aim to demonstrate progress on these actions by reporting on their achievements. As a first step, the Fluoropolymer Products Group is currently working on a review of wastewater related monitoring activities. The objective is the identification of best practices and possibly recommendations for procedural changes.

### 7 OPEN AND TRANSPARENT DIALOGUE WITH KEY STAKEHOLDERS

Continue to engage in an open and transparent dialogue with policymakers, employees, NGOs and other key stakeholders.

# Examples of PFAS uses in Automotive sector



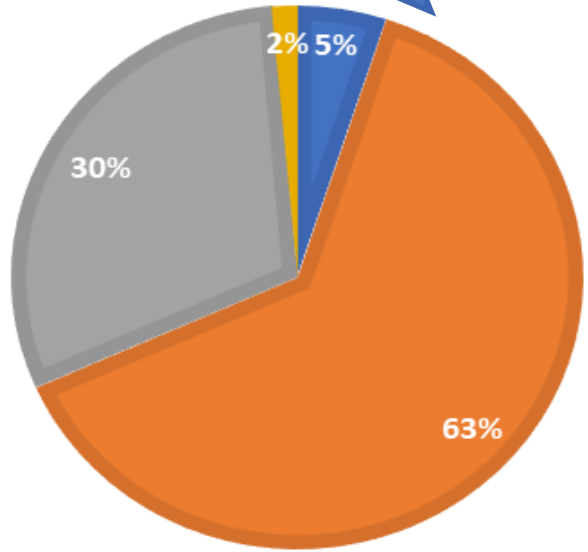



# Examples of PFAS uses in Automotive sector

## PFAS usage in ICE/EV

- 1/3 specific to ICE
- 2/3 needed for EV

Exemples:
- Fuel cell membrane
- PVDF battery cathod




Exemples:
- Semi conductors
- ABS actuator & controller
- Brake sensor
- Tire valve
- Camera
- Air conditionning compressor

Exemples:
- Lambda sensor
- Fuel gaskets
- Chain tensionner

# Example of PFAS uses in Automotive sector

## Reason for using PFAS in vehicles

- The combined use properties
  - **Low friction**
  - **Heat resistance**
  - **Low permeation**
  - **Chemical / fuel stability**
  - **Durability**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# Annexe 1

Exemples de secteurs, utilisateurs de Fluoropolymères, impactés par la restriction

# Examples of fluoropolymers in the Chemical Process Industry

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## Types of fluoropolymers and applications

| | |
|---|---|
| PTFE<br>PFA/MFA<br>ETFE<br>ECTFE<br>FEP<br>FKM<br>PVDF | Gaskets<br>Vessel liners<br>Pump lining<br>Valve and pipe lining<br>Coating<br>Expansion joints and bellows<br>Filters in flue gas systems<br>Electrolyser in Chlor-Alkali Industry<br>Heat exchangers in power plant<br>de-sulferisation units |

# Chemical Process Industry

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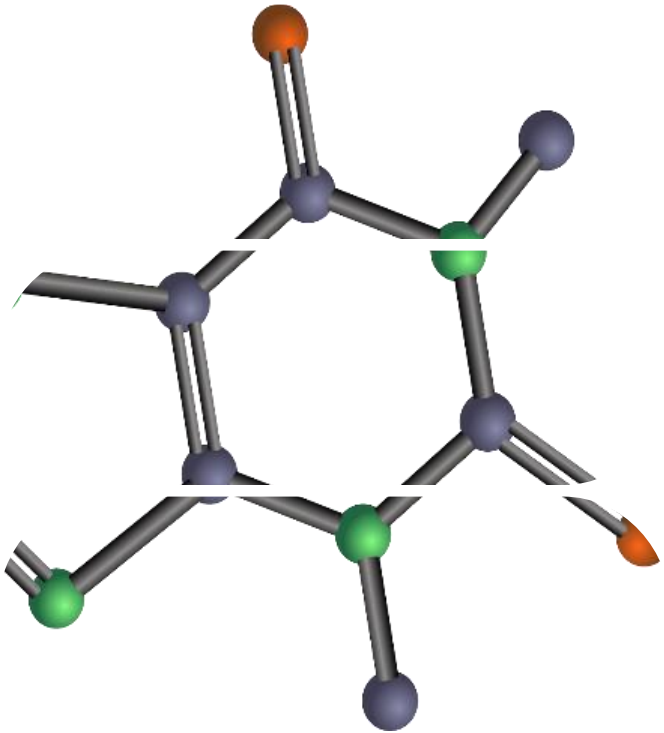
**Key benefits of fluoropolymers**

- In general, fluoropolymers in chemical manufacturing equipment are used to protect steel housing against a harsh chemical environment. They prolong the life of equipment, including pipes, fittings etc., prevent chemicals spilling into the environment and keep workers safe.
- The key properties of FLPs are their ability to function under continuous service temperature (up to 260C for PTFE) and resistance to harsh chemicals.

**Issues with alternatives**

- In harsh enviroments, materials that do not withstand these enviroments as well are sometimes used. This results in more frequent shutdowns of complicated processes - which is inherently unsafe - and may cause unwanted spills and accidents.
- An alternative, in some cases, is the use of exotic alloys which significantly drives costs up.
- The chemical industry is highly efficient and added capital cost will reduce profitability in comparison to non-European peers.



# Examples of fluoropolymers in aerospace

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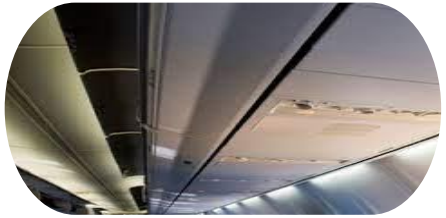

## Types of fluoropolymers and applications

| | |
|---|---|
| PTFE<br>PFA/MFA<br>ETFE<br>ECTFE<br>FEP<br>PVF | Fly by wire systems<br>Wi-Fi wiring<br>In-flight entertainment wiring<br>Fuel hoses<br>Interior film<br>Jet engine parts<br>Overhead bins<br>Liq oxygen seals |

# Aerospace industry

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Key benefits of fluoropolymers

- Fluoropolymers in aircrafts are used to ensure:
  - Safety – in particular fire safety
  - Weight savings – often in combination with safety
  - Hygiene - Easy clean surfaces

Issues with alternatives

- Alternative materials in most cases increase the weight of the aeroplane and have an adverse effect on fuel economy, by increasing the carbon footprint.
- Most importantly are the low smoke and fire resistance properties of Fluoropolymers in critical systems as well as in aircraft interiors – which will give extra seconds to vacate an aeroplane that save lives

# Examples of fluoropolymers in Electronics

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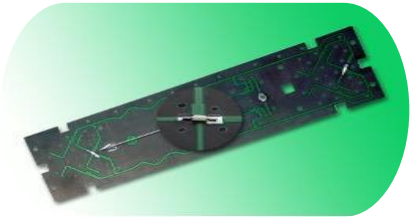
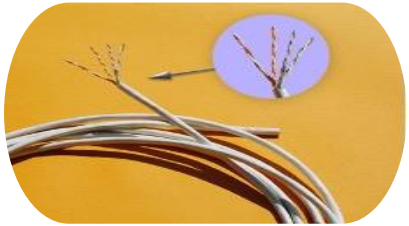


## Types of fluoropolymers and applications

PTFE
FEP
PFA
ETFE
PVDF

Cabling:
- Plenum
- USB-C
- MT riser cables manufacturing

PC casings
HF wiring boards
IC cushioning
Mobile telephone antennas



# Electronics industry

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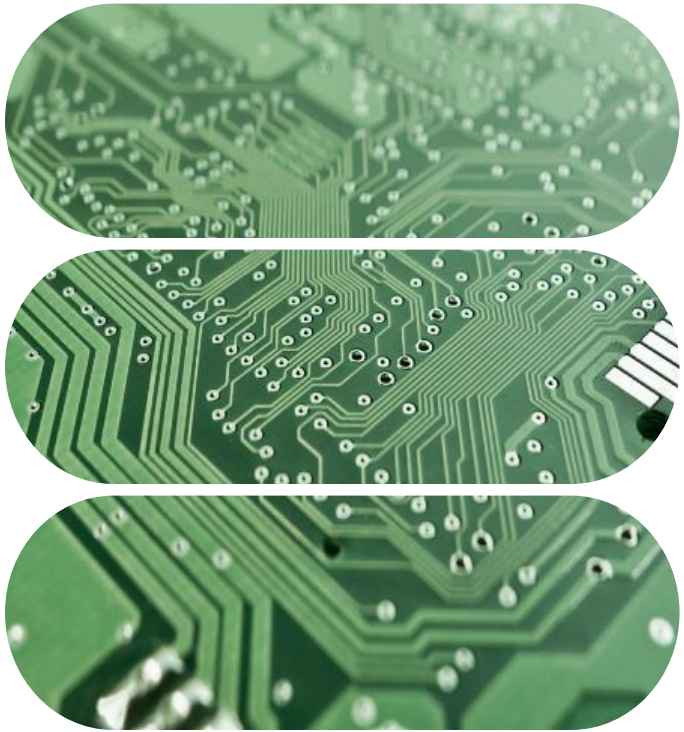
**Key benefits of fluoropolymers**

- Excellent dielectric properties in combination with other properties, as resistance to high soldering temperatures and flammability/low smoke are the reasons FLPs are used in a wide area of applications.

**Issues with alternatives**

- Alternatives impact performance and fire safety.
- Other materials lack excellent electrical and thermal insulating properties, which are crucial for miniaturisation in electrification and digitalization. Ordinary wires aren't equipped to handle the high-power consumption and high frequencies of 5G radios and cells, USB-C cables and plenum cables and are  flammable.



# Examples of fluoropolymers in Semiconductors

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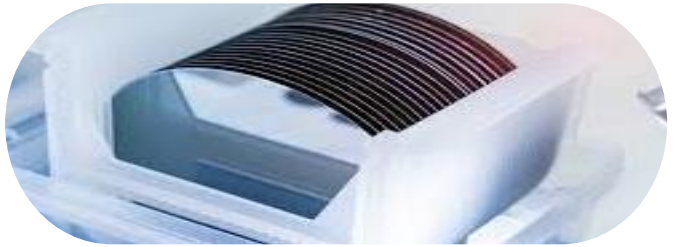
## Types of fluoropolymers and applications

| | |
|---|---|
| PTFE<br>PFA<br>PVDF | Semi-Conductor manufacturing<br>Liquid handling systems<br>Wafer carriers |



# Semiconductors industry

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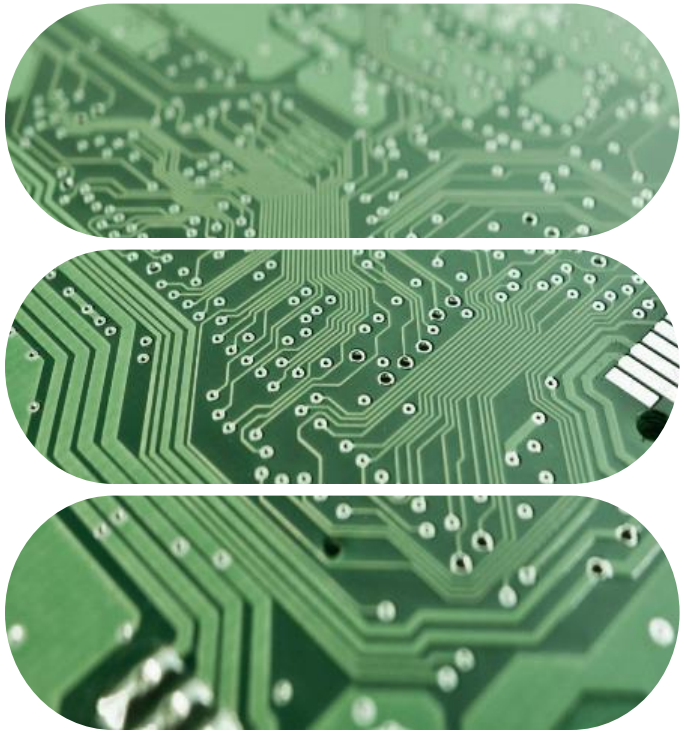
**Key benefits of fluoropolymers**

- High purity FLPs in semiconductor manufacturing is needed to keep aggressive fluids used in manufacturing ultra pure. It allows larger wafers and, therefore, ever-improving and affordable microchips and LEDs due to higher production yields in semiconductor manufacturing.

**Issues with alternatives**

- There are no alternatives if manufacturers want to get to current wafer size. A larger wafer diameter enables producing more semiconductor devices from a single wafer, enhancing productivity and efficiency. If foundries would still produce 1 inch wafer today, there is no chance they'd be able to support the volume of smart-phones, tablets and PCs.



# Annexe 2

## Grands axes de la restriction PFAS

# Pre-published PFAS restriction proposal – Restriction & Derogations

| Sectors proposed for NO DEROGATION | |
|---|---|
| Applications in cookware, cosmetics, textiles packaging, chrome plating, ski wax, consumer mixtures, MDI propellants, electronics, coatings, films, tapes, etc<br><br>*This is a non-exhaustive list, please refer to the proposal for the full list* | **The pre-publication version of the proposal states that given the sufficiently strong evidence pointing to the existence of technically and economically feasible alternatives, there are a broad range of uses where no derogation from restriction is proposed.** |

# Pre-published PFAS restriction proposal – Restriction & Derogations

| Sectors proposed for TIME-LIMITED DEROGATION | |
|---|---|
| Polymerisation aids in the production of polymeric PFASs (the proposal however, excludes from such a derogation the use of polymerisation aids in the manufacturing of PTFE, PVDF and FKM). Some technical textiles; food contact materials, fire suppressing agents, insulating gases, some implantable medical devices, tubes and catheters, additives to hydraulic fluids for anti-erosion/anti-corrosion in hydraulic systems (incl. control valves) in aircraft and aerospace industry; refrigerants in mobile air conditioning (MAC)-systems, refrigerants in some transport refrigeration, proton-exchange membrane (PEM) fuel cells, some lubricants, fluoropolymer applications in the mining and petroleum sector, etc<br><br>This is a non-exhaustive list, please refer to the proposal for the full list | **The proposal states that given given the sufficiently strong evidence pointing to the non-existence of technically and economically feasible alternatives at EiF, a derogation is** |

# Pre-published PFAS restriction proposal – Restriction & Derogations

| Sectors proposed for POSSIBLE DEROGATION | |
|---|---|
| ***Inconclusive evidence:*** *Conflicting evidence from one or different lines of evidence, where conflicts cannot be explained and reconciled*<br><br>Examples include: Textiles for the use in engine bays for noise and vibration insulation used in the automotive industry; non-stick coatings in industrial and professional bakeware; hard chrome plating; foam blowing agents in expanded foam sprayed on site for building insulation; industrial and professional use of solvent-based debinding systems in 3D printing; propellants for technical aerosols for applications where non-flammability and high technical performance of spray quality are required, hernia meshes; wound treatment products, cleaning and heat transfer: engineered fluids for medical devices, rigid gas permeable (RGP) contact lenses and ophthalmic lenses; membranes used for venting of medical devices; etc<br><br>This is a non-exhaustive list, please refer to the proposal for the full list | **There are proposals for potential derogations that require further investigation/presentation of evidence before making a decision on whether to grant them** |

# Pre-published PFAS restriction proposal – Restriction & Derogations

| Sectors proposed for TIME-UNLIMITED DEROGATION |
| --- |
| There are also a number of time un-limited derogations from restriction: PFAS used as active substances in Plant Protection Products (PPP), Biocidal Products (BP) and human and veterinary Medicinal Products (MP), as these are addressed under their respective regulations. |