A REVIEW OF PFAS AS A CHEMICAL CLASS IN THE TEXTILE SECTOR

Policy Brief, 2021

saicm

UN environment programme

BACKGROUND

For over a decade, under both SAICM and the Stockholm Convention on Persistent Organic Pollutants (POPs), the class of chemicals known as PFAS is gaining increasing international attention. Since 2009, chemicals in products have been identified as an Emerging Policy Issue and PFAS as an Issue of Concern by the Strategic Approach to International Chemicals Management (SAICM). The textiles sector is currently considered in the SAICM context through the 'Chemicals in Products Programme', which focuses on four priority sectors: textiles, toys, building products and electronics. The activities concentrate on increasing the availability and access to information on chemical use throughout the product's life cycle.

Furthermore, identifying PFAS as an issue of concern under SAICM has enhanced efforts on gathering and exchanging information on PFAS and supports the transition to safer alternatives. This work has been coordinated by the Global Perfluorinated Chemicals Group, which is supported by the Organisation for Economic Cooperation and Development (OECD) and the United Nations Environment Programme (UNEP).

Applying the class approach to manage PFAS in the textile sector connects two important issues covered in the SAICM context. First, the textile sector is an appropriate choice given the environmental significance of the sector generally. Second, the quantity and the wide variety of PFAS uses within the sector also makes it a priority for PFAS action. The textile sector's globally spread value chain, which includes companies of all sizes, can also provide significant lessons for capacity building and enabling conditions that can later extend to other sectors.

This policy brief examines the scientific, policy, and practical reasons for approaching PFAS as a class. It also identifies enabling conditions for advancing improved public health and environment protection in the textiles sector, for consideration by SAICM and other stakeholders.

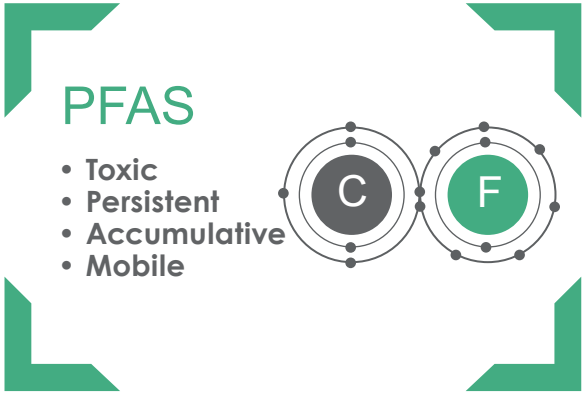
PFAS – TOXIC, PERSISTENT, ACCUMULATIVE, AND MOBILE

PFAS is short for per- and polyfluoroalkyl substances. It is a large family of thousands of synthetic chemicals that are widely used throughout society and found in the environment.

Health effects associated with PFAS include cancer, hormone disruption, liver and kidney damage, developmental and reproductive harm, changes in serum lipid levels, and immune system toxicity, with some of them occurring at extremely low levels of exposure. Drinking water standards for PFAS have been set in some jurisdictions in the single-digit parts-per-trillion range.

PFAS are extremely persistent, often referred to as "forever chemicals." They do not break down easily and can accumulate in our bodies, as well as in our surrounding environment.

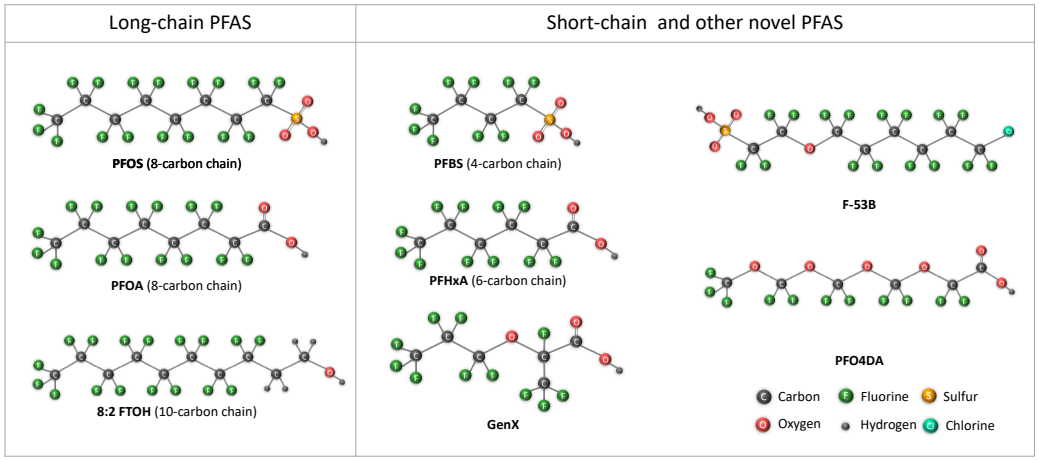
PFAS can also be highly mobile. Once PFAS are released into the environment, they can spread quickly. Major routes of human exposure are contaminated food, water, air, consumer products, and household dust.



MANAGING PFAS AS A CLASS

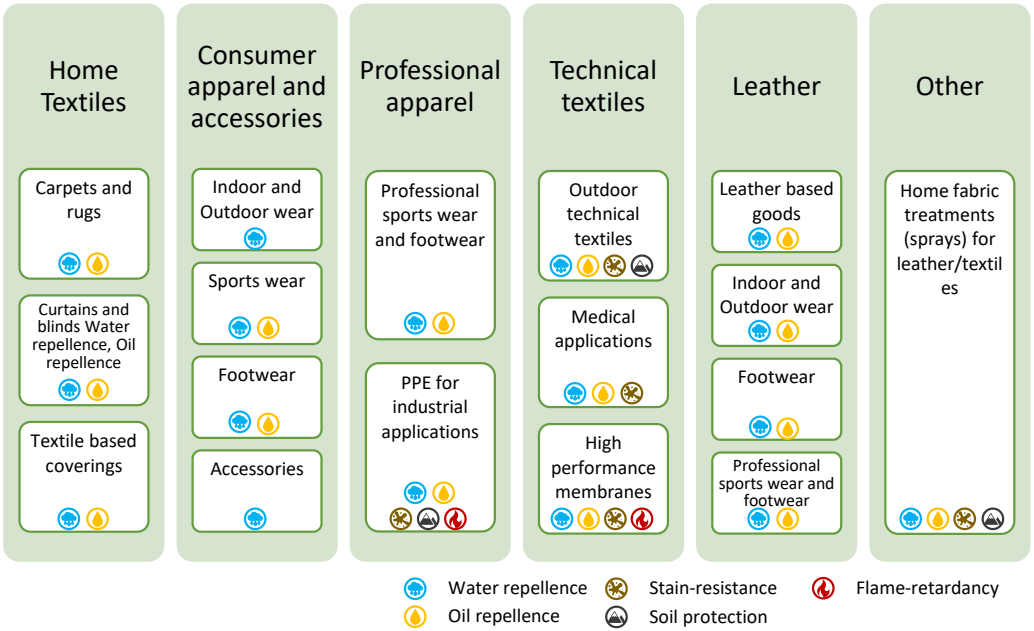
While the PFAS terminology encompasses thousands of different chemicals, the cornerstone chemical structure for the entire class is the carbon-fluorine bond. This common structural relationship forms the underlying foundation for addressing PFAS as a class, in conjunction with related technical and policy bases.

First, it is the strength of this bond () that leads to the persistence and accumulation potential of PFAS in the environment for the entire class, contributing to significant human and environmental exposure. Second, while the toxicity of legacy, long-chain PFAS is well studied and documented, there is a growing body of evidence indicating similar toxicologic effects for their PFAS relatives. Third, the process and chemistry of PFAS production and degradation in the environment defies sub-categorization, since industrial processes and molecular changes can result in environmental release of toxic PFAS even where they are not intentionally manufactured or used. Fourth, methods for measuring total fluorine or organic fluorine are a more comprehensive and cheaper option for monitoring PFAS. Fifth, some of the newer PFAS are even more mobile (water soluble) and harder to remediate than the PFAS already targeted for action, further supporting the case for preventing additional releases where it is possible to do so.



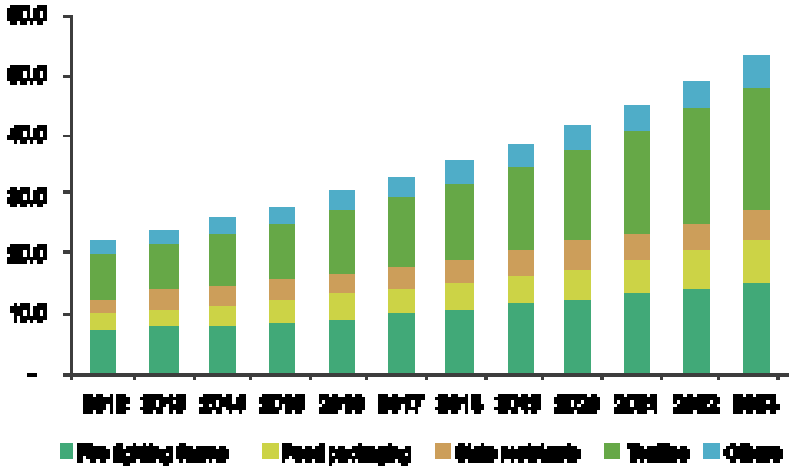
Finally, given the number of structurally similar chemicals with known or potential hazards in this chemical class, there is no practical alternative to class management. It would be impossible to collect data on toxicity, production, use, and exposure for every PFAS chemical within a reasonable timeframe to protect public health. In the absence of a class approach, the already experienced regrettable substitutions of one toxic PFAS for another will be with us for generations to come.

PFAS IN THE TEXTILE SECTOR



PFAS are widely used for their water-, stain- and oil-repellant properties in the textile industry. Some of the textile products that may contain PFAS include fashion apparel, uniforms, sportswear, outdoor gear, footwear, carpet and rugs, backpacks, swimwear, and upholstery. The figure below shows the overview of how PFAS is used in the textile industry.

The textile industry has been identified as the biggest user of fluorotelomers, with an estimate of 36% of the total market. Without intervention, the textile sector is projected to continue on the top of the list in the coming years[1].



Global fluorotelomers market forecast. Source: Global Market Insights, 2016

[1] Source: Kunal Ahuja and Kritika Mamtani, Fluorotelomers Market Size by Product (Fluorotelomer Iodide, Fluorotelomer Acrylate, Fluorotelomer Alcohols), by Application (Textiles, Stain Resistant, Food Packaging, Fire Fighting Foams), Industry Analysis Report, Regional Outlook, Application Potential, Price Trends, Competitive Market Share & Forecast, 2016–2023, Global Market Insights, April 2016, accessed January 20, 2021, https://www.gminsights.com/industry-analysis/fluorotelomers-market. Color modified for better representation of this report.

THE WAY FORWARD

Approach PFAS as a class for production and use control purposes

Government Sector

- Eliminate non-essential PFAS productions/uses and prohibit analogous exports to the developing world
- Promote research and development on safe alternatives for identified currently essential uses
- Periodically review uses deemed essential to account for development of alternatives development
- Improve and expand global access to testing methods
- Facilitate data gathering, and international cooperation/capacity building
- Facilitate private sector initiatives through purchasing decisions and awareness raising
- Strengthen collaboration between all actors in the textiles value chain

Private Sector

- Adopt PFAS elimination policy at highest corporate levels
- Understand the supply chain and provide educational materials/training to suppliers to facilitate PFAS identification
- Inventory known and potential PFAS sources and uses – establish a baseline
- Assess essentiality of PFAS uses and alternatives, and make results known while protecting proprietary information
- Conduct research and development on safe alternatives for identified essential uses
- Improve and expand global access to testing methods
- Implement policy and monitor progress
- Report policy implementation results transparently and confirm through a third-party audit

This document was prepared as an in-kind-contribution under the Global Environment Facility (GEF) full sized project 9771: Global best practices on emerging chemical policy issues of concern under the Strategic Approach to International Chemicals Management (SAICM). It draws from and complements:

NRDC, "Engaging the Textile Industry as a Key Sector in SAICM: A Review of PFAS as a Chemical Class in the Textile Sector," 2021

FURTHER READING

NRDC, "Engaging the Textile Industry as a Key Sector in SAICM: A Review of PFAS as a Chemical Class in the Textile Sector", 2021, https://www.saicmknowledge.org/library/engaging-textiles-industry-key-sector-saicm-review-pfas-chemical-class-textile-sector.

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