

# FAQ

## What the Textile and Leather Industries Should Know About PFAS Substances (Per- and Polyfluoroalkyl Substances)



Regulatory scrutiny regarding per- and polyfluoroalkyl substances, known as PFAS, is increasing at a rapid rate as both regular citizens and concerned scientists learn more about the potentially harmful impact these chemicals can have on human health, from birth defects to types of cancer. PFAS are known as “forever chemicals” because they do not degrade over time and permeate the environment and, eventually, human tissue. In fact, in the Environmental Protection Agency estimates that in 2024, one in four Americans are drinking tap water contaminated with PFAS chemicals at levels more than recently proposed standards.

The concern about PFAS is a global issue, and regulations have been enacted or proposed by countries around the world due to their indisputable impact on humanity and historic ubiquity in the textile and leather industry to increase durability.

As a global leader in safety science, UL Solutions prepared this handy guide for the softline industry to connect brands, retailers and manufacturers with the

latest thinking, regulatory outlook and technical testing information needed to demonstrate compliance.

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### **Q: What are PFAS?**

A: PFAS is a large, complex group of manufactured chemicals—more than 10,000 substances. The Organization for Economic Co-operation and Development (OECD) defines PFAS as any substance that contains at least one fully fluorinated methyl or methylene carbon atom. The general properties of this class of chemicals include environmental persistence and mobility and the ability to be transported over large distances in the environment. Some PFAS chemicals are bio-accumulative, and other endpoints include reprotoxicity, immunotoxicity, and neurotoxicity.

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### **Q: Why are PFAS banned?**

A: PFAS chemicals are bioaccumulative, meaning they can build up over time. They are introduced into both humans and animals through the environment, soil, water, and air or through dietary intake from

contaminated food and water. PFAS are also persistent and do not degrade over a significant timeline. While this alone does not indicate prohibition of PFAS, these chemicals are linked to various health risks in humans and animals, including cancer, hormone disruption, liver and thyroid issues, interference with vaccine effectiveness, reproductive harm, and abnormal fetal development.

**Q: Where can they be found?**

A: PFAS chemicals are found in a wide variety of consumer products including apparel, footwear, carpets and rugs, home furnishings and upholstered furniture. They have typically been employed to increase resistance to oil, stains and water, aid in bleach or dye deposition, and other key uses.

**Q: In which countries or regions are PFAS banned or restricted specifically in the softlines industry?**

A: PFAS regulations are rapidly changing globally. Specific to the softlines industry, the United States has state-based regulations that focus on PFAS as a class of chemicals, rather than specific PFAS. Other countries and regions have current legislation that focuses on a select group of PFAS.

Summary of key regulations:

Location	Regulation	Scope
EU	Persistent Organic Pollutants (POP) Regulation (EU) 2019/1021	Perfluorooctane sulfonic acid (PFOS) and its salts and related substances, Perfluorooctanoic Acid (PFOA) and its salts and related substances Ban PFHxS
	Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)	C9-C14 Perfluoroalkyl carboxylic acids (PFCA) and PFCA-related substances
USA	Toxics in Packaging Clearinghouse (TPCH)	PFAS
	Various State Laws	PFAS
Canada	Prohibition of Certain Toxic Substances Regulations (SOR/2012-285)	PFOS, PFOA, C9-C20 PFCAs
China	中国严格限制的有毒化学品名录 (List of toxic chemicals strictly restricted in China)	PFOS and its salts and related substances
Japan	CSCL (Chemical Substances Control Law)	PFOS and its salts and related substances, PFOA and its salts and related substances Propose to ban PFHxS
New Zealand	Hazardous Substances and New Organisms Act 1996 (HSNO Act)	PFOS and its salts and related substances, PFOA and its salts and related substances Propose to ban Perfluorohexanesulfonic acid (PFHxS)

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**Q: Does the European Union restrict all PFAS?**

A: The European Chemicals Agency (ECHA) published a restriction proposal in February 2023, proposing a ban on 10,000 PFAS, including precursors. If adopted, the ban will be implemented under REACH Regulation (EU) N0 1907/2006. The regulation will impact several industries including the textile industry and packaging industry.

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**Q: Is the proposal restricting all PFAS in the EU also valid for the United Kingdom?**

A: Due to Brexit, the UK will have its own UK REACH legislation that may diverge from EU REACH. Regarding restrictions on PFAS in the UK, there is a proposal done by the UK's Health and Safety Executive (HSE). Interestingly, under this proposal, the field of application may be different with the possibility of exemptions for fluoropolymers, and the number of PFAS substances covered by the restrictions may be fewer. Under the UK proposal, substances must contain at least one fully fluorinated methyl carbon atom or two or more contiguous perfluorinated methylene groups. In the EU, compounds with a single methylene carbon are also within the scope of the restriction proposal.

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**Q: Can you provide an update on EPA's Toxic Substances Control Act (TSCA) recordkeeping and reporting rule?**

A: On October 11, 2023, US EPA finalized the reporting and recordkeeping requirements for per- and polyfluoroalkyl substances under Section 8(a)(7) of the Toxic Substances Control Act. The rule established a one-time reporting requirement for any entity that has manufactured or imported for commercial purposes at any time since 2011 a chemical substance, mixture or article containing PFAS.

The rule does not include a list of specifically identified substances. Instead, it applies to PFAS as a chemical category defined by molecular structure. The rule defines PFAS as any chemical substance or mixture containing a chemical substance that structurally contains at least one of the following three sub-structures:

- $R-(CF_2)-CF(R')R''$ , where both the  $CF_2$  and  $CF$  moieties are saturated carbons.
- $R-CF_2OCF_2-R'$ , where  $R$  and  $R'$  can either be  $F$ ,  $O$  or saturated carbons.
- $CF_3C(CF_3)R'R''$ , where  $R'$  and  $R''$  can either be  $F$  or saturated carbons.

The rule requires reporting by entities that have manufactured PFAS or imported PFAS or articles containing PFAS between January 1, 2011, and December 31, 2022.

Unlike other TSCA reporting rules, the PFAS reporting rule includes no de minimus concentrations or production volume thresholds below which reporting is not required. Furthermore, it includes no exemptions for polymers, impurities, research and development, or small businesses.

The information to be reported includes:

- Company and plant site information
- Chemical-specific information
- Categories of use
- Manufactured amounts
- Byproduct reporting
- Environmental and health effects
- Worker exposure data
- Disposal data

All information must be submitted during the applicable submission periods which run from November 12, 2024 to November 10, 2025, for small businesses that are subject to reporting based solely upon the importation of PFAS-containing articles, and from November 12, 2024 to May 8, 2025, for all other entities subject to the reporting requirements. Submissions must be prepared and sent electronically to the EPA using a PFAS reporting tool in the Agency's Central Data Exchange. Submitters

must maintain records that document information reported under this rule for a period of five years beginning on the last day of the submission period.

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**Q: What is the capability among service providers to measure total fluorine? How about the capability to test single per- polyfluoroalkyl substances and total content according to the limits of 25/250 parts per billion (ppb)?**

A: Some laboratories can test for total fluorine. However, research on the detection limit for total fluorine in consumer products does not show levels as low as 25/250 ppb. The detection limit for total fluorine is typically 10 to 20 mg/kg. It is not known if any laboratory can test all 10,000 targeted PFAS substances using liquid chromatography/tandem mass spectrometry (LC/MS/MS) or gas chromatography/mass spectrometry (GC/MS).

UL Solutions laboratories and other providers will have a list of PFAS they can test for as targeted substances. For these targeted substances it is possible to reach limits of 25 ppb as a single targeted substance and 250 ppb for the sum of target substances.

Are there test methods that measure total organic fluorine derived from PFAS that exclude other substances containing fluorine? What is the specific method?

Currently, there are no standard methods for measuring total organic fluorine derived from PFAS that meet these criteria. Unfortunately, when screening for total fluorine, methods do not determine if the fluorine is specific to PFAS or another type of fluorinated substance.

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**Q: What is the difference between total fluorine screening and total organic fluorine?**

A: Total fluorine (TF) determines the amount of fluorine in the sample, both organic and inorganic. UL Solutions uses combustion ion chromatography (CIC) to determine the total fluorine content. This method requires that the sample is placed on a ceramic boat which is then introduced to a combustion oven. The gases are collected and separated on an ion exchange column and measured by conductivity. Likewise, the same sample can be extracted with solvent and the solvent analyzed using CIC. The result is extractable organic fluorine or EOF. Some interpret EOF as total organic fluorine, assuming the total organic fluorine is 100% soluble in the extract.

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**Q: If I test for total fluorine, do I still need targeted PFAS testing?**

A: This will be dependent on the regulations and/or the brand's Restricted Substances List (RSL), and the outcome of the test.

For example, if you are testing to confirm compliance with California regulations that ban PFAS in paper, paperboard and plant-based food contact packaging, and the total fluorine content is <100 mg/kg, no further testing would be required.

If textile materials comply with both California and EU regulations, testing will be required for both total fluorine at <100 mg/kg starting from January 1, 2025, as well as extractable targeted PFAS substances to comply with EU regulations with a criteria of 25 ppb individual PFAS and 250 ppm for the sum of the PFAS analyzed, as the total fluorine content is not sensitive enough to reach the criteria found in the EU regulations.

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**Q: What does the test method landscape look like for PFAS?**

A: There are various strategies for testing, including total fluorine and targeted PFAS depending on the regulation. The softlines industry refers to either EN 14582:2016 or ASTM D7359:2023 for total fluorine analysis.

For select PFAS analysis, the industry refers to EN ISO 23702 -1:2023 or EN 17681-1:2022 (under revision prEN 17681-1:2023 Draft) & 17681-2:2022. If the total fluorine result is above the criteria of the regulations or specified RLS whether it is a brand RSL, or an Industry RSL,





an investigation with your supply chains to where the fluorine is coming from may be needed.

The total fluorine screening does not ensure that you meet the stricter requirements for targeted PFAS set forth by country-specific regulations such as REACH or POP regulations.

## How can UL Solutions help?

Demonstrating and maintaining compliance in a rapidly shifting regulatory environment can be challenging. UL Solutions offers softlines brands, retailers and manufacturers a comprehensive array of services to help understand and navigate PFAS regulations, plus chemical management services and expert guidance to mitigate compliance risk.

Our team of chemical professionals help develop a customized Restricted Substance List (RSL) to reduce the risk of non-compliant goods entering the marketplace. UL Solutions also offers industry-leading training products to help you stay ahead of regulatory changes and upcoming restrictions for PFAS.

As the world works together to shift away from PFAS, UL Solutions and the softlines industry can foster the growth of compliant products in the marketplace.

**Safety. Science. Transformation.™**



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