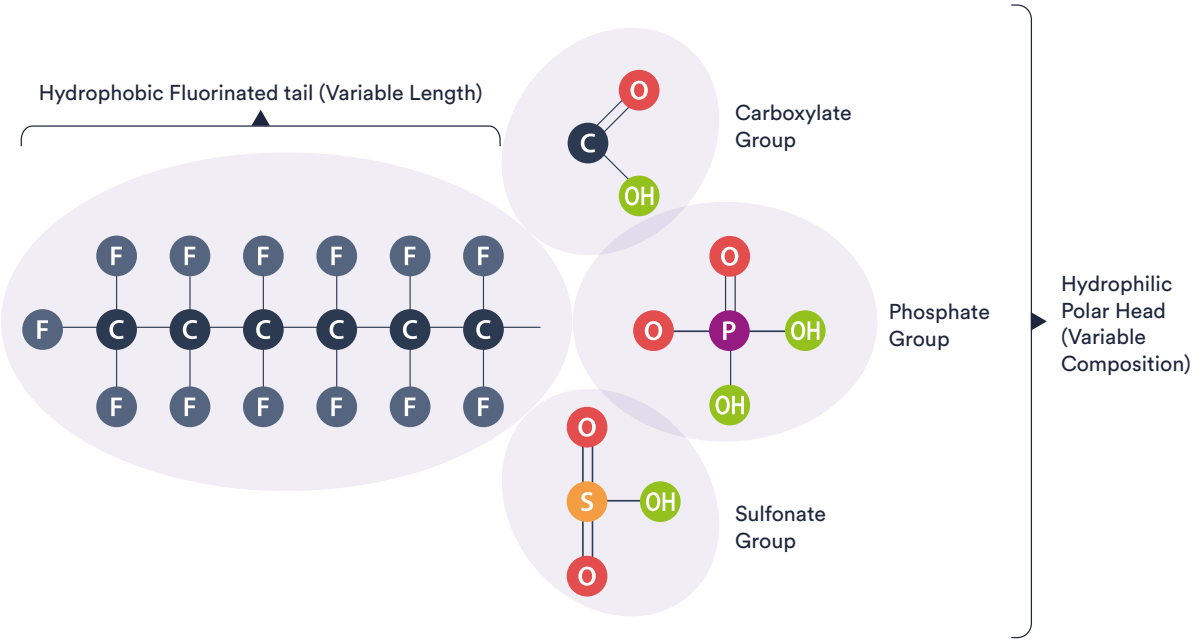
LES PFAS

Status report

What do you need to know about PFAS?

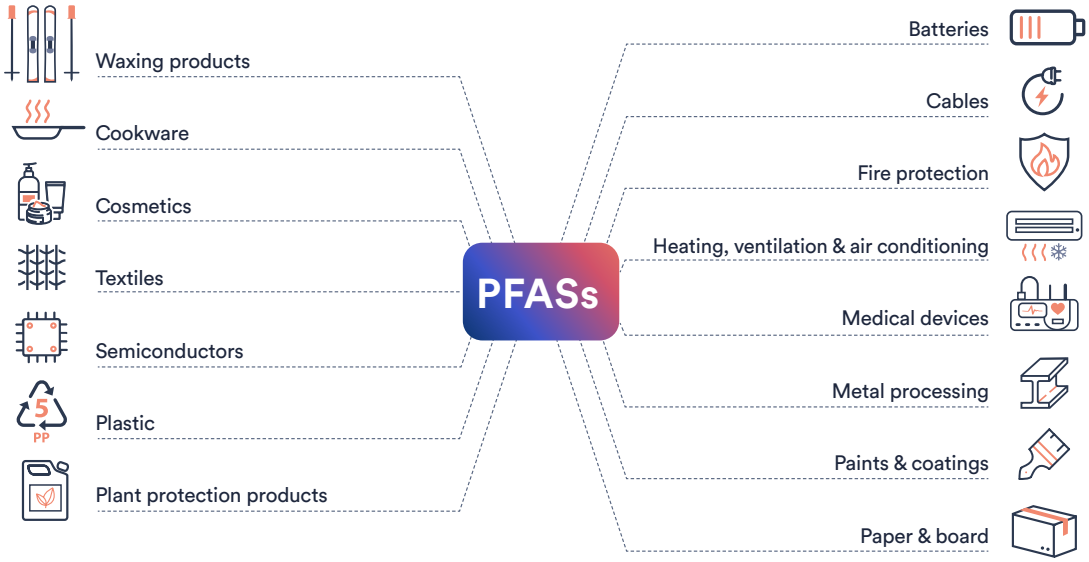
Behind this acronym lie thousands of synthetic per- and polyfluoroalkylated substances made up of hydrophobic carbon-fluorine (C-F) bonds and polar hydrophilic functional groups. They are known as amphiphiles:



Source : https://www.mdpi.com/2305-6304/10/2/44

These substances with diverse properties (non-stick, waterproofing, emulsifying, surfactant, resistant) form one of the strongest chemical bonds in organic chemistry. PFAS have been used in industry since the 1940s-1950s, particularly in the manufacture of paints, lubricants, cosmetics, textiles, food packaging, nonstick cookware and plant protection products. They are also used in construction, the medical and pharmaceutical industries, oil and mining, electronics, treatment of waste water, and more.

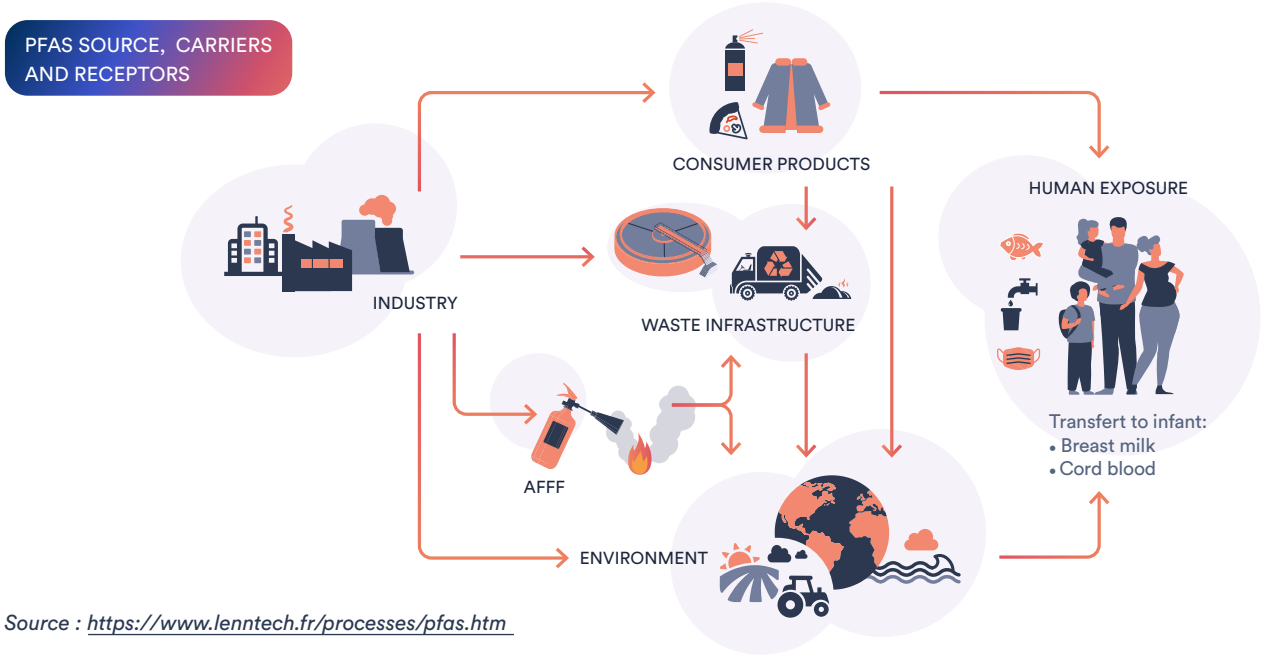
In the firefighting sector, they are used in the manufacture of AFFF (Aqueous Film-Forming Foam) emulsifiers which are effective on flammable liquid fires thanks to their surfactant properties. Chemical plants, refineries, airports, shipyards, and military bases are all places where PFAS-based AFFF emulsifiers are likely to be found.



Source : https://substitution-perfluores.ineris.fr/fr/faq

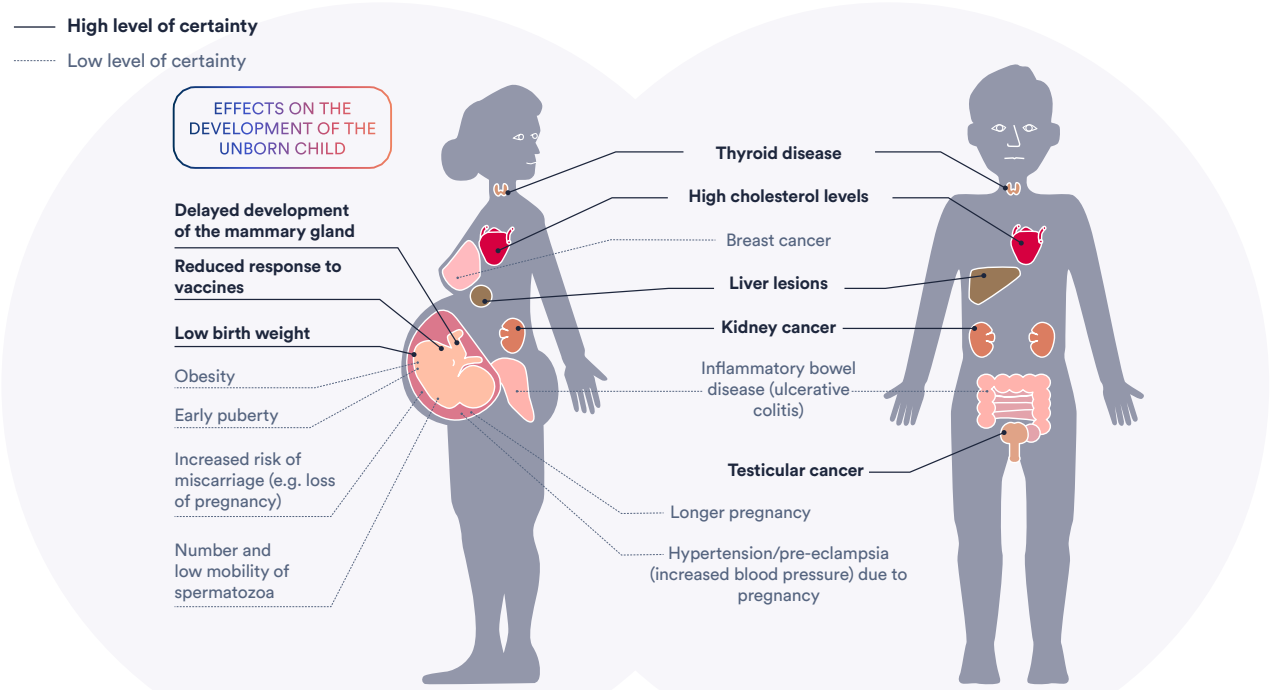
Issues raised by PFAS

Because of their amphiphilic structure, PFAS are both persistent (due to the stability of their C-F chemical bonds) and highly mobile. The downside is that for a large number of them, these highly resistant chemical bonds hardly degrade at all over time, so much so that they are referred to as “forever” and “persistent” pollutants. What’s more, most of these substances are easily transported/dispersed (in water and air) and can travel long distances from their place of production/use. It has been found that PFAS are present in air, soil, groundwater, and surface water, that they are difficult to treat/recycle and that they can therefore build up in the environment, water, food, and ultimately in our organisms (bioaccumulation).

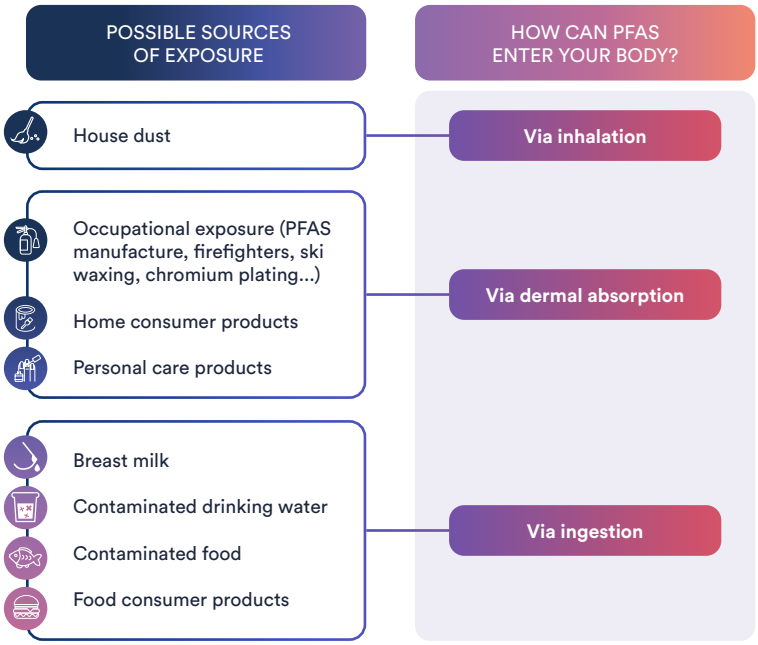


Source : https://www.lenntech.fr/processes/pfas.htm

At this stage, studies show that exposure to PFAS may be the cause of cancer and several other diseases: reduced fertility, cardiovascular problems, diabetes, thyroid disorders, cholesterol, and obesity.
What's more, there are many different exposure pathways: water, food (mainly of animal origin), house dust, products for professional or personal use, and the work environment, whether by inhalation, ingestion or skin contact.



Sources : US National Toxicology Program (2016); C8 Health Project Reports (2012); CIRC OMS (2017); BARRY et al. (2013); Fenton et al. (2009); et White et al. (2011) apud Emerging chemical risks in Europe - «PFAS».



Source : www.hbm4eu.eu/wp-content/uploads/2022/06/HBM4EU_Policy-Brief-PFAS.pdf

Studies tend to confirm the toxicity/ecotoxicity of certain PFAS, given that the harmfulness of certain PFAS is no longer in dispute (especially PFOS and PFOA), due to the persistent, bioaccumulative, and harmful nature of these substances.

Litigation and financial issues

USA - Maturity of lawsuits and judicialization

The first lawsuits appeared in the early 2000s in the United States (DuPont - PFOA - Teflon) when research into the harmfulness of PFAS was in its infancy and it was difficult to establish a causal link between exposure to the substances and the alleged harm.

PFAS litigation began in 2009 when water utilities in Ohio and Florida filed lawsuits against chemical companies to recover the costs of removing chemicals from their water. Since then, the lawsuits have expanded to include class actions seeking compensation for drinking water contamination, personal injuries related to the direct use of these products, such as the firefighters exposed to PFAS from firefighting foams or flame-retardant clothing. **Over 10,000 lawsuits have been filed in the US since 2000, involving 418 companies and 152 industries. More than 6,000 lawsuits have been filed against DuPont, with 3M being sued an average of three times a day in 2021.**

The financial stakes in the US (in addition to the inflationary context and judicialization in this country) could exceed several hundred billion dollars, given the multiplicity of claims:

- Water providers - suppliers/distributors of drinking water - demanding water purification,
- Water consumers claiming personal injury,
- Damage to flora and fauna,
- Depreciation of contaminated real estate.

This is evidenced by the latest settlements by the major chemical companies involved in the manufacture and/or use of PFAS during 2023:

- In June 2023, Chemours, DuPont and Corteva reached an agreement worth over $1 billion to settle a dispute with local residents and water providers,
- 3M also signed an agreement in principle in June 2023 for the same reasons as above, for $12.5 billion,
- Solvay followed suit in June 2023 with an agreement worth over $390 million in respect of its West Deptford site in New Jersey,
- Tyco signed a $750 million agreement in April 2024 for firefighting foams (Foam Co.),
- And BASF signed an agreement worth over $315 million for fluorinated synthetic emulsifiers (AFFF).

In summary, $18 billion has already been paid out to date, with $4 billion in reserves held by the major manufacturers, making total estimated losses to date of around $150 billion.

Europe – The beginning of judicialization

Beyond the United States, the first lawsuits in Europe and France are beginning to appear.

In Belgium, in July 2022, the American multinational 3M agreed to pay €571 million to the Flanders region to settle a dispute over years of toxic emissions around its Zwijndrecht plant in the Belgian port city of Antwerp.

In May 2023, 3M also had to pay €2,000 in interim compensation to a family living near its Zwijndrecht plant.

In Sweden, the Supreme Court ruled in December 2023 that residents of a community whose blood contained high levels of PFAS as a result of contaminated drinking water had suffered personal injury on the basis of product liability.

In the Netherlands, Chemour was sued in September 2023 by 2,700 plaintiffs in a class action lawsuit for PFAS contamination of soil, air, and surface water.

Chemour was also found liable for PFAS-related damage in the 1980s and 1990s in a preliminary ruling by the Court of Rotterdam.

In France, the majority of the lawsuits/litigations brought before the French courts, whether criminal, civil, or administrative, are located in the eastern Lyonnais region, the heart of the French chemical industry. These lawsuits are being brought by NGOs, associations, trade unions, and the mayors of neighboring towns, and are aimed at stopping/restricting the use of certain PFAS products (through summary proceedings) or establishing serious damage to the environment and neighboring communities.

Litigation, although still in its early stages in France, should in all likelihood lead to the first convictions, given that a large arsenal of resources is being deployed, as PFAS have become a public health issue.

- Normal sanitary control of distributed drinking water,
- A new French/European standard,
- Greater attention being given to the subject from politicians, the media and the public.

Regulatory responses

In Europe:

To date, European and national regulations cover only a few of the thousands of PFASs that exist.

As far as legislative/regulatory responses are concerned, the 2001 Stockholm Convention regulates several compounds in the PFAS family: this applies in particular to substances that are regularly incriminated and proven to be harmful/toxic, such as PFOS, PFOA and PFHxS, which have been banned since 2009, 2020 and 2022 respectively. Several studies are underway to **extend the Stockholm Convention to other families of perfluorinated compounds.**

Also at European level, the REACH Regulation which aims to safeguard the production and use of chemicals is currently undergoing a process of change: consideration is being given to extending the range of prohibited PFAS substances and potentially limiting them to uses that are essential for society, with both targeted exemptions based on long transition periods and exemptions of unlimited duration for specific uses. The affected uses and whether technically and economically feasible alternatives exist will be key.

200 USES LISTED FOR 1,400 PFAS*

Industries and other use categories where PFAS have been or are being used. Numbers in brackets indicate the number of subcategories. No brackets mean no subcategories.

Industry branches	
Aerospace (7)	Mining (3)
Biotechnology (2)	Nuclear industry
Building and construction (5)	Oil & gas industry (7)
Chemical industry (8)	Pharmaceutical industry
Electroless plating	Photographic industry (2)
Electroplating (2)	Production of plastic and rubber (7)
Electronic industry (5)	*Semiconductor industry (12)*
Energy sector (10)	Textile production (2)
Food production industry	*Watchmaking industry*
Machinery and equipment	Wood industry (3)
Manufacture of metal products (6)	

Other use categories	
Aerosol propellants	Metallic and ceramic surfaces
Air conditioning	Music instruments (3)
Antifoaming agent	Optical devices (3)
Ammunition	Paper and packaging (2)
Apparel	Particle physics
Automotive (12)	Personal care products
Cleaning compositions (6)	Pesticides (2)
Coatings, paints and varnishes (3)	Pharmaceuticals (2)
Conservation of books and manuscript[s]	Pipes, pumps, fittings and liners
Cook- and bakingware	Plastic, rubber and resins (4)
Dispersions	Printing (4)
Electronic devices (7)	Refrigerant systems
Fingerprint development	Sealants and adhesives (2)
Fire-fighting foam (5)	Soldering (2)
Flame retardants	Soil remediation
Floor covering including carpets and floor polish (4)	Sport article (7)
Glass (3)	Stone, concrete and tile
Household applications	Textile and upholstery (2)
Laboratory supplies, equipment and instrumentation (4)	Tracing and tagging (5)
Leather (4)	Water and effluent treatment
Lubricants and greases (2)	Wire and cable insulation, gaskets and hoses
Medical utensils (14)	

1ST DIAGNOSTICS OF AVAILABLE ALTERNATIVES**

Estimated annual tonnages for PFAS manufacture and major PFAS use sectors for 2020 (low, mid and high estimates) (Annex XV, p75).

Application	Total PFASs (t/y)		
	Low	Mid	High
Manufacture	117 902	257 132	396 362
TULAC[b]	41 183	91 938	142 692
Food contact materials and packaging	18 597	24 185	29 772
Metal plating and manufacture of metal products	962	990	1 017
Consumer mixtures	21	26	30
Cosmetics	0.028	32.1	64.2
Ski wax	1.6	1.6	1.6
Applications of fluorinated gases[c,d]	*493 173* 30 671	*493 173* 30 671	*493 173* 30 671
Medical devices	24 672	43 100	61 527
Transport[c]	*97 216* 6 410	*159 712* 10 532	*222 208* 14 653
Electronics and semiconductors	2 541	4 423	6 304
Energy sector	2 885	3 050	3 214
Construction products	5 241	8 983	12 725
Lubricants	1 171	1 666	2 160
Petroleum and mining	3 504	5 507	7 510
TOTAL (excl. manufacture)[e]	**691 168**	**836 787**	**982 398**
Total[f]	137 860	225 105	312 341

TULAC = Textile, Upholstery, Leather,Apparel Sector

** Source : https://pubs.rsc.org/en/content/articlelanding/2020/em/d0em00291g*

*** Source : https://echa.europa.eu/fr/registry-of-restriction-intentions/-/dislist/details/0b0236e18663449b*

The revised European Directive on the quality of water intended for human consumption (WIHC) that was transposed into French law at the beginning of 2023 provides for the monitoring of these substances and requires that the total amount of 20 of them does not exceed a threshold in drinking water (0.50 µg/l for total PFAS; or 0.10 µg/l for all of the 20 PFAS substances of concern).

The European Directive on Priority Substances for Water Policy of August 12, 2013 sets an environmental quality standard for PFOS and its derivatives.

EU Regulation 10/2011 on plastic materials and articles intended to come into contact with foodstuffs sets specific use limits or migration limits for the ammonium salts of PFOA and PFPoA.

The European texts transposed into French law are listed below:

- Executive order no. 2022-1611 of December 22, 2022 on access to and quality of water intended for human consumption, and its two implementing decrees;
- Ministerial order of February 2, 1998 on emissions from a majority of installations classified for the protection of the environment (ICPE) that are subject to environmental permits, which targets PFOS by setting a concentration limit value of 25 µg/l in water discharged into the natural environment;
- France's water status monitoring program was recently revised by the Ministerial order of April 26, 2022, which includes the 20 PFAS listed in the December 2020 WIHC Directive for groundwater and PFOS for surface water.

In France, we can also cite the Ministerial order of December 30, 2022 on the quality limits and references for raw water and water intended for human consumption and the Ministerial order of June 20, 2023 on the analysis of per- and polyfluoroalkyl substances in water discharges from facilities classified for the protection of the environment under the permitting regime.

In addition, on January 17, 2023, the French Ministry of Ecological Transition and Territorial Cohesion launched an action plan named PFAS 2023-2027. One of the primary objectives of this plan is to improve understanding of the progress made in the measurement and treatment of PFAS and the levels of contamination through the analysis of industrial discharges.

THE PLAN IS BASED ON 6 STRATEGIC PRIORITIES

1. Establish discharge and environmental standards to guide public action;
2. Introduce a Europe-wide ban to eliminate risks related to the use or marketing of PFAS;
3. Improve understanding of discharges and environmental impregnation, particularly in aquatic environments, to reduce population exposure;
4. Significantly reduce emissions from industrial emitters;
5. Ensure transparency of available information;
6. Include PFAS in the micropollutant plan in the medium term.

In the USA:

The EPA (Environmental Protection Agency) is considering adding 9 PFAS to the CERCLA list:

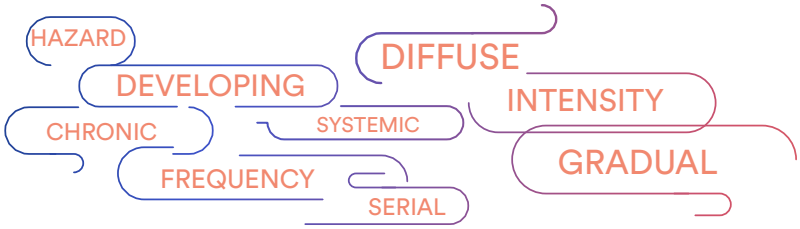
a. Perfluorooctanoic acid (PFOA)
b. Perfluorooctane sulfonate (PFOS)
c. Perfluorobutanesulfonic acid (“PFBS”)
d. Perfluorohexanesulfonic acid (“PFHxS”)
e. Perfluorononanoic acid (“PFNA”)
f. Hexafluoropropylene oxide dimer acid (HFPO-DA) (also sometimes called “GenX”)
g. Perfluorobutanoic acid (“PFBA”)
h. Perfluorohexanoic acid (“PFHxA”)
i. Perfluorodecanoic acid (“PFDA”)

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), passed in 1980, imposes a no-fault liability regime for contamination caused by hazardous substances, particularly on producers of these substances, for clean-up and decontamination operations.

The 9 PFAS mentioned above will therefore be classed as hazardous substances.

Insurance solutions

In response to the growing concerns about PFAS, regulatory developments, and the legal action and lawsuits already being filed against certain companies, insurers, encouraged by their reinsurers, are questioning the nature of PFAS risk and its insurability.



A working group has been set up by France Assureurs, in collaboration with the reinsurance commission, including mapping work.

In view of the above, several policies and coverages are affected:

- **Third Party Liability policies,** including Gross Negligence on the part of the employer, Product Liability, Withdrawal/removal and reinstallation costs, Professional Liability, and Legal Protection,
- **Environmental policies:** Environmental Liability, Environmental Damage and Environmental Liability, Prevention costs, and Clean-up costs,
- **Directors’ and Officers’ liability policies:** Defense costs.

Many insurers have already opted to include general exclusions for all damage involving PFAS in their Liability and/or Environmental insurance policies, as was the case with asbestos in the past.

These exclusions are becoming increasingly numerous, particularly in the case of exposure in the US and for sectors deemed to be highly exposed (manufacturers of chemicals, foam and/or firefighting equipment, cookware, food packaging and/or materials in contact with food, carpets and textiles, paper production and processing, the oil and oil-related industries, public authorities, airports and military installations, and waste/water management).

The trend in Environmental insurance policies is also towards PFAS exclusions.

As a preliminary point, it should be noted that **the general exclusion clauses required by the insurance/reinsurance market do not have the formal, limited character dictated by Article L113-1 of the French Insurance Code,** in that they are subject to interpretation and strip the coverages of all or part of their substance.

In fact, **the exclusions listed generally apply to all PFAS** although this acronym covers thousands of substances that are defined within in a constantly evolving scientific and regulatory framework.

Nevertheless, underwriting discipline varies between insurers in Europe, sometimes within the same insurance company whose underwriting policy in respect of the same business sector is applied differently depending on the country.

In this context, **it is essential to check whether or not insurance policies contain exclusions and to be prepared for the possibility of them being added when the policy is renewed,** whether this is in the insurer's General or Special Conditions.

Upstream, the risk mapping to be carried out by each company should make it possible to assess the impact of such exclusions on the insured activities. Assessing the policyholder's exposure to PFAS therefore requires these activities to be identified and characterized.

Based on this analysis, the aim is then to tailor the exclusion to the insured activities/products. As the list of PFAS of concern covered by the regulations is admittedly evolving, but limited, the optimal solution would be to restrict the exclusion to PFAS that are banned from use and/or whose properties or characteristics have been shown to be harmful, toxic, polluting or dangerous.

Recent renewal campaigns for both Third Party Liability and Environmental risks demonstrated that, despite firm underwriting policies and the application of general PFAS exclusions, **it is possible to negotiate sub-limits and/or exclusion buy-backs with insurers.**

These buy-backs were made possible by the open sharing of extensive underwriting information and the involvement of Diot Siaci's teams in collaboration with those of the insurer and the policyholder (use of questionnaires, engineering meetings, interaction between legal departments, etc.).

These buy-backs are sometimes crucial, as certain applications/products account for a significant proportion of the turnover of the companies concerned.

What's more, some essential industries currently have no reliable substitute for PFAS. In fact, alternatives are difficult to find when PFAS are used under extreme conditions: for example, certain types of protective equipment, uses involving very low or very high temperatures, and very high voltages.

In some business sectors, PFAS-related issues come up against the challenges of ecological and digital transition. Examples include membranes for H2 production, fuel cells, batteries, semiconductor production, and lubricants and seals for certain industrial applications.

Despite this last point, as the reinsurance market becomes increasingly aware of the issues surrounding PFAS and fears a risk of accumulation, **there is cause for concern over the introduction of partial or total exclusions in reinsurance treaties,** making discussions and negotiations with insurers increasingly complex. When it comes to the renewals at January 1, 2025, the utmost vigilance will be required !