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Factsheet | PFAS substances

November 2025

Introduction

PFAS (poly- and perfluoroalkyl substances) is a collective term for a group of chemical substances. These substances are man-made and do not occur naturally. More and more research is being carried out into the risks posed by the various PFAS substances, both in terms of the environment and toxicity. As a result, they are regularly featured in the news. These materials have many different applications in a wide variety of products, including both industrial and consumer goods.

In this factsheet, we focus primarily on the use of PFAS in packaging materials and provide further information on the properties, legislation and potential risks associated with PFAS substances.

What are PFAS substances?

Poly- and perfluoroalkyl substances, abbreviated as PFAS, are man-made chemicals. The group of PFAS substances consists of more than 10,000 different substances. This group of substances is characterised by its high water- and oil-repellent properties. They are also highly stable both thermally and chemically. Because of these properties, they are used in packaging materials that come into contact with food. Examples include popcorn bags, fast-food packaging, paper straws, paper cups, cake boxes and pizza boxes[1].

There is a great deal of variation in the amount of information available on the different PFAS substances. A considerable amount of research has been carried out into the properties and environmental or health hazards of some substances, while virtually nothing is known about other substances within the same group[2].

PFAS applications

PFAS refers to a large group of substances and, as such, is used in many different applications. These can be divided into a number of categories.

Ingredients or excipients

PFAS substances used in products as an ingredient or excipient in order to impart specific properties to the end product. Examples include applications in refrigerants, heat pumps, insulation materials and pesticides[1].

Surfactants

Some PFAS substances have surface-active properties, which means that the end products can be easily applied to a surface. PFAS substances are used as surfactants in products such as paint, fire-extinguishing agents, personal care products and resins[1].

Coatings

PFAS substances that are used as a protective coating on products due to their high water- and oil-repellent properties. Coatings based on PFAS substances are used on items such as textiles, solar panels, aircraft components and medical equipment.

PFAS-based coatings are also used in the food industry. Such coatings are used, for example, on pans or machinery in production[1]. PFAS substances have been added to paper and cardboard food packaging that comes into direct contact with food since 1960, due to their water- and oil-repellent properties[2].

Dangers

Various studies are currently being conducted into the risks posed by PFAS substances to both human health and the environment. As mentioned earlier, a number of PFAS substances are already known to pose greater risks. This is the case, for example, with PFOS, PFOA and GenX. Virtually nothing is known about the adverse effects of other PFAS substances because no research has been carried out on them to date. Consequently, it is also not known what risks arise when humans or the environment are exposed to several PFAS simultaneously[5].

Of the substances for which information is available, we can classify the hazards into two categories: health risks and environmental risks.

Health risks

In 2020, the EFSA (European Food Safety Authority) reassessed the health risks to humans[4]. In doing so, they have reassessed various studies that have been conducted on these substances[3].

- This assessment found a link between the presence of certain PFAS substances in the blood and a reduced immune system response. A less effective immune system can cause people to fall ill more often or more quickly[4].
- Adverse effects were also found on cholesterol levels, liver function and birth weights in babies[4].
- PFAS substances can accumulate in the body and may also affect the thyroid and fertility[4].
- The Tolerable Weekly Intake (TWI) has been set at an extremely low 4.4 nanograms per kilogram of body weight per week[4].

Environment

PFAS substances enter the environment through various applications and emissions. PFAS substances are found in the soil and in water. As they are difficult to break down (forever chemicals), they also persist in the environment for a long time[3, 5].

As a result of this environmental pollution, PFAS substances can end up in our food. People can be exposed to PFAS substances through, amongst other means, drinking water, fish and seafood, animal products such as (offal) meat, game, milk and eggs, and plant-based products such as fruit and vegetables[3, 4]. PFAS pollution is a global problem and is even found in rain and groundwater.

Legislation and guidance

European Union: food contact materials

When poly- and perfluoroalkyl substances are used in materials that come into direct contact with food, these substances may migrate into the food. The European Plastics Regulation (EU) No 10/2011 sets migration limits for various poly- and perfluoroalkyl substances. Due to the risks involved, these substances must not migrate from the packaging material into the foodstuffs in quantities exceeding these migration limits[6].

Dutch legislation

The Commodities Act Regulation on Packaging and Consumer Goods (Warenwetregeling verpakkingen en gebruiksartikelen) contains a 'positive list' that specifies which substances are permitted for use in packaging materials and consumer goods. With effect from 1 July 2022, the authorisation for certain substances containing PFAS (PFOA, PFOS,
PFNA and PFHxS) as a starting material, impurity or degradation product has been withdrawn. Four PFASs that were previously on the positive list for paper, cardboard and coatings have been removed. The substances in question are as follows[12]:

- ammonium bis(N-ethyl-2-perfluorooctanesulphonamideethyl) phosphate, containing no more than 15% ammonium mono(N-ethyl-2-perfluorooctanesulphonamideethyl) phosphate;
- copolymers of 2-(perfluorooctylsulfonylaminomethyl)ethyl methacrylate, 2,3-epoxypropyl methacrylate, ethoxyethyl acrylate and methacryloylmethyltrimethylammonium chloride;
- perfluoroalkyl(C6–C16)(C6–C18) phosphates of bis(2-hydroxyethyl)amine.
- diethanolamine salts of mono- and bis(1H,1H,2H,2H-perfluoroalkyl(C8–C18)phosphates.

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

The restriction procedure under the REACH Regulation for the entire group of approximately 10,000 PFAS compounds is well underway[8, 9]. In January 2023, the Netherlands, Germany, Denmark, Sweden and Norway submitted an official restriction proposal to the European Chemicals Agency (ECHA)[9]. Following a consultation that
received over 5,600 responses, ECHA published an updated draft proposal in August 2025[9].

ECHA's scientific committees (RAC and SEAC) are assessing the dossier in stages, and the plan is for them to issue their final opinion to the European Commission in the spring of 2026[9]. A general ban on PFAS, including transition periods, is expected to come into force by the end of 2026 at the earliest.

New packaging regulation (PPWR)

With its new Packaging and Packaging Waste Regulation (PPWR), the European Union is now taking broader action. This regulation imposes stricter requirements on packaging that comes into contact with foodstuffs (Article 5(5))[11]. The legislation regulates all packaging and focuses on the concentration of PFAS in the packaging itself, rather than on migration into food.

The PPWR sets the following limits for PFAS in food contact materials:

- 25 ppb (parts per billion) concentration for a single PFAS
- 250 ppb concentration for the total sum of PFASs
- 50 ppm concentration for total fluoride

From 12 August 2026, packaging containing higher concentrations will no longer be permitted on the market.

United States (US) – FDA

In January 2025, the US Food and Drug Administration (FDA) permanently revoked its approval of 35 Food Contact Notifications (FCNs) relating to the use of grease-resistant coatings that contain PFAS in paper food packaging[10]. This withdrawal follows a voluntary phase-out by manufacturers. As a result, these PFAS substances have no longer been permitted as non-stick coatings in food packaging in the US since 30 June 2025[10].

Control measures

For businesses, the PPWR means that PFAS management must become an integral part of food safety systems. Companies must take a proactive approach and can do so by taking the following steps:

1. Inventory check: Identify which packaging may contain PFAS and request declarations from suppliers.
2. Assessment & documentation: Assess the packaging and record the findings in a dossier.
3. Prevention throughout the supply chain: Opt for PFAS-free alternatives and establish an internal policy stipulating that PFAS are no longer to be used in primary packaging.

Dossier requirements (PPWR)

The PPWR requires companies to be able to demonstrate that their packaging is compliant with the limits. The dossier must contain technical documentation demonstrating the safety of the packaging, including:

- Explanations and analyses.
- Supplier information.
- Test results.
- Certificate of conformity.

The dossier must not only describe what is being used, but also explain why it meets the PPWR requirements. The transition from functional packaging to packaging that is both safe and sustainable requires transparency and cooperation.

Interesting links

- Packaging materials | Netherlands Nutrition Centre
- Special report on the ban on PFAS | RIVM
- PFAS-Tox Database|
- PFAS | Netherlands Nutrition Centre
- MXNS | Ready for the new standard in packaging legislation

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The dossier must not only describe what is being used, but also explain why it meets the PPWR requirements.

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