

Analysis of PFAS in Firefighting Foam

Testing to stay ahead of growing regulations!

Per- and polyfluorinated alkyl substances (PFAS) are a large class that may include more than 15,000 compounds. Over the last 25 years, environmental and health effects caused by PFAS exposure have become a great concern. PFAS have many uses, with firefighting foam (AFFF = Aqueous Film Forming Foam) being one of the major ones. All activities may give rise to environmental pollution of soil, water, and other matrices, and AFFF used during firefighting is among the most common sources.

Background

The development of aqueous film-forming foams (AFFF) containing PFAS goes back to the 1960s, with widespread use from the 1980s onwards. The primary usage has been as so-called "Class B" foams combating flammable liquid fires. Decades of use at military bases, airports, and industries have led to significant contamination. PFAS are highly persistent in the environment due to their strong carbon-fluorine bonds earning them the nickname, "forever chemicals".

In recent years, regulatory efforts have accelerated to phase out PFAS-containing foams and replace them. Legislation affecting PFAS in AFFF is thus becoming more comprehensive, and the EU POP ((EU) 2019/1021; PFOS, PFOA, PFHxS) and REACH regulations ((EU) 1907/2006; e.g. PFHxA, C9-C14 PFCA) are examples, with limits of 25 ppb (except PFOS) in products. There is also a proposed general PFAS restriction for AFFF in the EU (D102503/01 (2024); limit 1 ppm). The International Maritime Organization (IMO) has banned PFOS in AFFF on ships from 1 Jan 2026.

PFAS in AFFF

The PFAS composition of AFFF can vary substantially. Historically, AFFF has contained legacy compounds such as PFOS, PFHxS, and PFOA, but also so-called precursors to these substances. Precursors are substances that can degrade to perfluorinated end-products such as PFOS and PFOA. Therefore, precursors are often considered "related substances" in POP and REACH. Modern foams typically contain more advanced molecules. Studies have shown (e.g., KEMI PM 6/15) that current products are mostly based on 6:2 telomer structures. One of these substances (which is also a precursor), which has recently gained attention, is 6:2 FTAB; however, there are others (e.g. DPOSA, 6:2 FTSAS).

PFAS Analysis

Individual PFAS in foam can be determined using so-called "target" analysis (e.g. PFOS and PFOA). TOP (Total Oxidizable Precursors) is a method used to chemically oxidize precursors to the corresponding perfluorinated carboxylic acids (PFCA). TOP can provide information on the types of precursors in the sample as well as an overall quantitative estimate. This information can be valuable when evaluating "related substances" according to the POP and REACH regulations.

Eurofins (SE) has been analyzing AFFF since 2017. To simplify ordering, analysis, and reporting, we offer specific packages. For



target analysis, we have a PFAS18 pack including regulated PFAS (PFOS, PFHxS, PFOA, PFHxA etc.) as well as other common PFCA, PFSA, and FTS substances. A second package contains 45 PFAS and covers additional "simple" precursors as well as AFFF constituents e.g., 6:2 FTAB and DPOSA. Our TOP package comprises the same 18 compounds as the target package and includes the C4–C9 PFCA most frequently formed during TOP oxidation (also for compounds included in the PFAS 45 package). Our recommendation is to perform a target analysis together with the TOP assay; therefore, we have introduced a PFAS18 combo pack for easy ordering.

We recommend to use our 100 mL plastic PFAS bottles. Sample volumes required are 50 ml (min. 20 ml) for concentrated foam or "ready-to-use" dilutions (e.g. 3% or 6%). For rinse water or firefighting water please use one of our packs for unclean water and send 2x100 ml. Turnaround time (TAT) 10 working days.

Firefighting Foam – PFAS packages	Code
PFAS 18 in fire fighting products	PLWBT
PFAS 45 in fire fighting products	PLWBW
PFAS (TOP) 18 in fire fighting products	PLWBX
TOP PFAS 18 combo (before/after TOP) in fire fighting products	PLWBY

Unclean Waters – PFAS packages*	Code
PFAS 20 - (EU) 2020/2184 (DWD)	PLW9C
PFAS 21 - (EU) 2020/2184 (DWD + 6:2FTS)	PLWLY
PFAS 24 - prel WFD (EQS)	PLW8K
PFAS 30 - PFAS24 and PFAS 20/21/22	PLW9E
PFAS (TOP) 28	PLWHM
TOP PFAS 28 combo (before/after TOP)	PLWBK

*Examples only. More packages are available at [eurofins.se](https://www.eurofins.se)

Orders

Bottles can be ordered on our website free of charge. *It is very important that the matrix is stated on the order and that you indicate if high PFAS levels are expected.* Further information on the packages for foam and unclean water can be found in our online catalogue: <https://analyskatalog.eurofins.se/>

We reserve the right to make changes and/or correct errors.