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fomtec
Fire Fighting Foams & Equipment

Fomtec Technical Advice
FTA No. 125

Information relating to current EU legislation and restrictions on PFAS compounds, proposed EU legislation on total PFAS in firefighting foams, and the impact to clients using firefighting foam

Introduction

Although all the major firefighting foam manufacturers (including Fomtec) voluntarily stopped manufacturing PFOA (C8) containing firefighting foam concentrates by 2016 regulatory bodies around the world have seen fit to enact legislation restricting and ultimately banning the production and use of these firefighting foam concentrates.

Since 2016 all the fluorinated firefighting foam concentrates produced by Fomtec have been formulated with shorter-chain fluorinated chemicals, sometimes known as "C6". These foam concentrates may contain trace impurity levels of PFOA (C8) but they will be below the levels regulated by EU 2017/1000.

All Fomtec fluorinated foam concentrates comply with EU regulations as follows:

- EU 2017/1000, EU 2020/784, EU 2021/1297, EU 2024/2462, POPs regulation 2019/1021

Please note that the previous statement is supported by data using current analytical methods.

EU Legislation

PFOA(C8) and PFOS(C8) have been restricted for some time now, and these restrictions are supported by the fact that both substances have been defined as Persistent Organic Pollutants (POP), and they are suspected to be carcinogenic and toxic to reproduction. Additional to this PFOA is also classified as being PBT (Persistent, Bioaccumulative and Toxic).

In 2006, PFOS in foam above a limit of 50 ppm (50mg/kg) was banned when Directive 2006/122/EC came into force. In Annex I of EU Regulation 2019/1021, PFOS was limited to 10ppm. The latest update in the POPs regulation 2019/1021 is the amendment with the comission adpotion on the 14 th of April 2025. The limits of PFOS was adopted to 25 ppb of PFOS and its salts and 1000 ppb of related substances, as an unintentional trace contaminent due to align with the limits of PFOA. In 2019 PFOA was banned and according to the third document EU 2019/1021 under Article 5, Stockpiles above 50kg of PFOA must be reported to the appropriate authorities (Usually the Environmental Agency). Finally in the EU 2020/784 amendment 2020 PFOA was regulated by ECHA to the limits:

- PFOA/PFOS or one of its salts: 25ppb (0.025mg/kg)
- each individual PFOA/PFOS precursor compound or combination of PFOA/ PFOS precursor compounds: 1ppm / 1000 ppb (1mg/kg)

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Training, manufacturing, and placing on the market was banned. For foam concentrates in tank of fire engines and extinguishing system it is only allowed until 4th of July 2025, when containment is possible. There is a draft to extend this exemption until 3rd of December 2025. This transition period for PFOA only applies to firefighting foams used to fight class B fires. In case of an analysis the result will be below detection level.

PFAS long and short chain

Per-and polyfluoroalkyl substances can be divided into short chain and long chain PFAS, depending on the length of the fluorinated carbon chain. Perfluorooctanoic acid – PFOA and perfluorooctane-sulphonate - PFOS are examples of long chain PFAS with eight carbon atoms (C8-chemistry). PFHxS - perfluorohexane sulfonate and PFHxA - perfluorohexanoic acid both belong to the family of short-chain PFAS , with six carbon atoms (C6 chemistry).

Long chain PFCA Perfluorocarbon Acids C9-C14

The European Commission restricted perfluorocarboxylic acids containing 9 to 14 carbon atoms in the chain (C 9 -C 14 PFCAs), their salts and their related substances on the 4th of August 2021 according to regulation (EU) 2021/1297 to amend entry 68 of Annex XVII to REACH (EC) No 1907/2006.

Limit values are:
Sum of **C9-C14-PFCA** and their salts: **25ppb** (0.025mg/kg)
Sum of **C9-C14 PFCA**-related substances**: 260ppb** (0.26mg/kg)

Training with was banned 25th of August 2021 and manufacturing and placing on the market is no longer allowed. Storage by end users and foam concentrates in already existing installations (tank of fire of engines and extinguishing systems) are allowed until 4th July 2025, if it can be contained and collected. However, after 4th July 2025 it will no longer be allowed and will be discontinued. The transition period of C9-C14 PFCA only apply to Class B fires. Dafo Fomtec has not used any raw materials containing PFHxS nor PFCAs C9-C14 in its' fluorosurfactant products like AFFF, ARC(AR-AFFF), FP, FFFP or FFFFP-ARC after 2016. In a case of an analysis of Fomtec products the result will be below detection level.

PFHxS Perfluorohexane sulfonic

PFHxS was identified as POPs chemicals in Annex A to the Stockholm Convention in June 2022. On the 28th of August 2023 the European Commission published the ban of perfluorohexane sulfonic acid (PFHxS) , its salts and PFHxS-related compounds under POPs (persistent organic pollutants) regulation.

PFHxS has also been added to ECHAs candidate list. 18 months after force of entry (28th February 2025) PFHxS shall not be manufactured or placed on the market. Stockpiles above 50kg of PFHxS must be reported to the appropriate authorities (Usually the Environmental Agency)
PFHxS can be formed from the degradation of other PFASs that have a longer carbon chain, such as perfluorooctanesulfonic acid (PFOS) or perfluorooctane sulfonamide (PFOSA)

The EU regulation restriction limits for foam concentrates are:

- **PFHxS** or one of its salts: **25ppb** (0.025mg/kg)
- each individual **PFHxS precursor** compound or combination of PFHxS precursor compounds: **1000 ppb/1 ppm (1mg/kg)**

This will result in the unintentional trace contamiant of PFHxS of 0,1mg/kg(100ppb), placing on the market and use.

PFHxA Perfluorohexanoic acid

On the **19 th of September 2024** the European Commission published the ban of Perfluoro-hexanoic (PFHxA), its salts and PFHxA-related substances. It was restricted by the Commission Regulation (EU) 2024/2462 amending Annex XVII to Regulation (EC) No 1907/2006 of the EU Parliament and of the Council. The transition period is 18 months and 5 year after force of entry depending on the usage.

PFHxA will not be allowed to be placed on the market, or used, after 10 th of April 2026 concentration:

• Equal to or greater than 25 ppb (0.025mg/kg) for the sum of PFHxA and its salts

• 1000 ppb/1 ppm (1mg/kg) for the sum of PFHxA-related substances in:

- **firefighting foams for training and for testing** (except functional testing of the firefighting systems, provided that all releases are contained).

- **firefighting foams and firefighting foam concentrates for public fire services**, except wherethose services intervene at industrial fires at establishments covered by Directive 2012/18/EU of theEuropean Parliament and of the Council (10) and they use the foams and the equipment for that purpose only.

As of October 10, 2029, PFHxA will not be allowed to place on the market, or used, in concentrations equal to or greater than 25 ppb for the sum of PFHxA and its salts and 1000 ppb for the sum of PFHxA-related substances for **civil aviation**.

The PFHxA restriction covers a linear or branched perfluoropentyl group with the formula C5F11-directly attached to another carbon atom as one of the structural elements; or having a linear orbranched perfluorohexyl group with the formula C_6F_{13}-.

In order to cover all the precursors for 6:2 FTS telomers (which is the most common C6 technology fluorosurfactant used in firefighting foam) ECHA has coved, PFHxA-related substances that, based on their molecular structure, are considered to have the potential to degrade or be transformed to PFHxA.

Universal PFAS ban for Fire Fighting foam 23 October 2025.

The universal PFAS ban in fire fighting foam is now a reality .The 2 nd of October 2025 ; the EU Commision had a meeting

Regarding COMMISSION REGULATION(EU) 2025/1988 ,amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council as regards per- and polyfluoroalkyl substances in firefighting foam. The force of entry for the legislation; 22 of October 2025 PFAS .

With a general transition period of 5 years, it is from 23 of October, 2030 not possible to placed on the market or use firefighting foams in a concentration equal to or greater than 1 mg/L for the sum of all PFAS. See below for the deroation and transisiton period for different application of fire fighting foam concentrate.

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Application	Transition time	Deadline
Portable fire extinguishers (hydrocarbons)****	12 months	23 October 2026
Alcohol-resistant firefighting foam in portable fire extinguishers*	18 months	23 April 2027
Training & testing, except functional testing of the firefighting systems provided that all releases are contained	18 months	23 April 2027
Public fire services and private fire services exercising the function of public fire services, except where those services intervene at industrial fires at establishments covered by Directive 2012/18 EU and the use of the foams and the equipment for that purpose only	18 months	23 April 2027
Portable fire extinguishers**	5 years	31 December 2030
For establishments covered by Directive 2012/18/EU	10 years	23 October 2035
For installations belonging to the offshore oil and gas industry	10 years	23 October 2035
Military vessels	10 years	23 October 2035
Civilian ships with firefighting foams placed on board before 23rd October 2025***	10 years	23 October 2035

* Placed in service. ** Alchohol Resistance. *** If the system is placed in after 23 Oct 2025, the transition time is 5 years.
**** Place on market. In use until 31st December 2030.

23 October 2026 the use of PFAS in firefighting foams in a concentration equal to or greater than 1 mg/L for the sum of all PFAS

- firefighting foams are only used for fires involving flammable liquids (class B fires)
- reduce emissions to the environmental
- ensure the separate collection of stock of not-utilized firefighting foams and PFAS-containing waste, including wastewater, originating from the use of firefighting foams- adequate handling, to destroy PFAS.

Applictions that will continue to use PFAS containing foam-during transition period, requires:

- Management plan (valid fo at least 15 y)
- Plans to implemented in the event of accidental leakage/spillage of firefighting foam along with relevant documentation of the follow-up actions;
- Strategy for substituting to fluorine-free firefighting foams.

Derogation -Level of Contaminates allowed in equipment and system

- Transition to SFFF
- After undergone cleaning equipment
- Rebound
- Contamination limits < 50 mg/ L total PFAS • This concentration limit should only apply to fluorine-free firefighting foams newly installed in equipment after its cleaning. In view of the developments on the measurement of the rebound effect and evolving cleaning methods for the equipment, the Commission should review this derogation within 5 years from entry into force of this Regulation. Fire extinguishers excluded.

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The legislation exclude :

• Perfluorooctane sulfonic acid (PFOS), its salts and PFOS-related compounds
• perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds
• perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds

in Annex I to Regulation (EU) 2019/1021
Which are subject to prohibitions should be excluded from the prohibition on the placing on the market and use.
• Perfluorocarboxylic acids with a chain length of 9 to 14 carbon atoms (C9-C14 PFCAs)

under entry 68 of Annex XVII to Regulation (EC) No 1907/2006
• Undecafluorohexanoic acid (PFHxA), its salts and PFHxA-related substances under entry 79 of Annex XVII to Regulation (EC) No 1907/2006
The PFAS substanes above are covered by the existing restriction and should be excluded from the restriction on the placing on the market and use.
The amount of PFAS from those derogated PFAS sub-groups should be included in the determination of the concentration of the sum of all PFAS for the purpose of this restriction.

Confirming that the firefighting foam concentrate complies with current legislation

To comply to PFOA, PFHxS and LC PFCA C9-C14 legislation the user needs to know if the foam was supplied prior to 2016. To have the information what foam concentrate that has been used in the past can be difficult. Chemical composition with information of classification is not always available and since 2016 both the classification system has been changed and there has been an update of the substances used in fire fighting foam. It should be established if there is a possibility of contamination in the tank / stores of PFOA, PFHxS and LC PFCA C9-C14. To be on the safe side samples should be collected in an approved container, according to correct instruction from qualified personnel and sent to an approved laboratory for analysis.

Examples of known and recognized laboratory standards are listed below:

- U.S.A. EPA 533, EPA 537 and EPA 1633
- EU & UK DIN 38407 / 42, UNEP Chemicals o Branch 2015 TOP Assay Environ.Sci.Technol. 2012,46,9342 9349
- Australia EP 231 and EP 231X (TOP)

Fomtec will use external accredited laboratories to perform this kind of analysis. The laboratory has different packages for the different PFAS substances that can be analysed. Following companies do offer this analysis and have the necessary equipment and qualifications to carry out the testing:

- Eurofins www.eurofins.com
- ALS www.alsglobal.com

For fire brigades, training and testing and civil aviation to comply with PFHxA legislation after transitionperiod, current PFAS containing foam on the market such as AFFF, ARC(AR-AFFF), FP, FFFP or FFFP-ARC - C6 6:2 FTS telomer based foam is no longer possible to use.

Assistance with decontamination of storage tanks and foam systems

Dafo Fomtec has never used intentionally added PFOS.

The legislation sets the limits for PFOA, PFHxS, LC PFCA C9-C14 and PFHxA in the foam concentrate or any solution (foam solution or wastewater) and what is allowed to have in the tank or system. Removal of the PFAS containing foam concentrate from the tank alone is unlikely to solve the contamination issue as residual levels of PFAS may be found in any remaining foam concentrate that is left in the tank or on any surfaces that have been in contact with the foam concentrate. Similarly, if the system has been run (in the case of mobile firefighting equipment this could include hoses, discharge nozzles etc.) and not been flushed thoroughly then contamination downstream of the proportioning device may also exist. Collection and testing of water from the discharge devices may be required to again prove that PFAS levels do not exceed the regulated limits.

A number of different cleaning / decontamination concepts are available that involve cleaning with water alone, cleaning with water that is mixed with additives, and cleaning including physical abrasion. In all cases the waste products from the cleaning would require disposal in accordance with the local authorities regulations.

Please note that current science indicates that the PFAS chemicals can only be destroyed through incineration at temperatures exceeding 1100 °C.

Appendices

The following links relate to the legislation referenced in this FTA

EU 2017/1000
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1000&from=EN

PoP EU 2019/1021
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02019R1021-20210315&from=EN

EC 1907/2006
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202402462

EU 2020/784
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0784&from=ES

EU 2021/1297
https://eur-lex.europa.eu/eli/reg/2021/1297/corrigendum/2022-03-10/oj/eng

EU 2024/2462
https://eur-lex.europa.eu/eli/reg/2024/2462/oj/eng

EU 2025/1988
https://eur-lex.europa.eu/eli/reg/2025/1988/oj/eng