

TI-064 - Regulation of per- and polyfluorinated substances in Europe

Per- und polyfluorinated¹ Substances

Substances of this type are so called fluoro organic compounds – chains of carbon atoms which are partly or completely surrounded by Fluorine atoms. This group of substances is often referred to as PFCs (perfluorinated carbons) or PFAS²

The fluoro carbon compounds are generally exceptionally stable against chemical and biological degradation processes hence persistent in the environment. In addition some specimen have meanwhile been identified to be hazardous to human health.

This prompted various authorities globally to take action to regulate PFAS. Europe's Commission being at the forefront of those initiatives.

REACH as the Bases

Basing on the European Chemical Law each member of the European Union is empowered to propose substances it considers hazardous to the Commission for regulation under REACH³.

Within the framework of a RMOA⁴ the Legislator evaluates if the hazards to the environment and human health resulting from the use of the substance require it to be regulated and if so to what degree respectively in which way.

The law instruments to regulate substances cover:

- Limitations for the manufacturing or use of individual substances or an entire substance group,
- requirement for permission of manufacturing and/or use
- A complete ban.

To date two PFC-type substances - each as lead compound of a substance group - have been identified to require being regulated:

PFOS⁵:

PFOS was the first substance of the PFAS group which was regulated in Europe:

In December 2006 the EU Commission adopted the regulation (EG) 2006/122 (amending regulation (EC) 76/769) prohibiting the manufacturing and placing on the market of PFOS and its precursors⁶ in the EU and installing a threshold limit of 50ppm (=mg/kg) PFOS and /or its precursors in articles and mixtures.

In August 2010 PFOS was put on the POPs⁷-List by signees of the Stockholm Convention. The Commission enforced as European law by amending regulation (EU) 850/2004 with 757/2010 reducing the threshold from 50ppm to 10ppm.

These regulations were replaced in June 2019 by the (EU) 2019/1021 on *persistent organic pollutants*.

Status Quo:

Products containing **more than 10ppm (=mg/kg) PFOS or its precursors must not be manufactured in the EU or placed on the market** – this particularly includes firefighting foam agents – **with no exempt**.

Firefighting foam agents which have been placed on the market prior to 2010 may need to be checked on their respective content of PFOS.

Any agent exceeding the current threshold limit must be disposed of immediately in agreement with local regulations for a safe disposal (e.g. thermal treatment in special treatment plants). Any further use is prohibited and may become subject to severe fines.

PFOA⁸

The second substance of the PFAS type having been regulated in Europe is the *Perfluoro Octanoic Acid*. This compound is considered to be the end-point of degradations of any so-called C8-compounds⁹ hence is defined as the lead substance for the entire group of C8-Fluorosurfactants and –polymers used in firefighting agents. In opposite to the regulation on PFOS this time not just the acid and its metal salts are covered but any molecule having a perfluorinated chain of seven or eight carbons hence literally any C8-Technology.

¹ The term per-fluorinated means that all Hydrogen atoms in a hydrocarbon molecule are replaced by Fluorine. In poly fluorinated carbons not all Hydrogens were replaced by Fluorine.

² PFAS = Perfluoro alkyl substances

³ Regulation (EG) 1907/2006 on „ Registration, Evaluation, Authorisation and Restriction of Chemicals“

⁴ Risk Management Options Analysis – Analysis of Options to minimise the risk caused by a chemical substance or substance group to the environment or human health

⁵ Perfluorooctylsulfonic Acid (C₈HF₁₅SO₂; CAS 1763-23-1)

⁶ Precursors are any substances having the potential to release the particular lead substance during their use or degradation.

⁷ POPs = Persistent Organic Pollutants, list of substances identified as persistent organic pollutants according to the Stockholm Convention.

⁸ Perfluorooctanoic Acid (C₈HF₁₅O₂; CAS 335-67-1)

⁹ Fluorine containing firefighting foam agents are either of the C8-type having a chain of eight carbons all of which are surrounded by fluorine. Or they are of the C6-Type (such as the 6:2-Telomers) having a chain of only six perfluorinated Carbons. According to recent studies C6-Type Fluorocompounds are reported to be significantly less hazardous yet still persistent.

Technical Information

The provisions of regulation (EU) 2017/1000 from July 13th concerning:

"Perfluorooctanoic acid (PFOA) CAS No 335-67-1 EC No 206-397-9" and its precursors being "Any related substance (including its salts and polymers) having a linear or branched perfluoroheptyl group with the formula C₇F₁₅- directly attached to another carbon atom, as one of the structural elements. Any related substance (including its salts and polymers) having a linear or branched perfluorooctyl group with the formula C₈F₁₇- as one of the structural elements."

Generally prohibit the manufacturing or placing on the market of the above defined group of substances as substance in mixtures or articles above a certain threshold.

The provisions have recently been recast by Regulation 2020/784/EU following the inclusion of PFOA and their precursors in the POP list and the transposition of the agreements of the Stockholm Convention into European law.

This will render ineffective some of the previously applicable exemptions for firefighting foam agents.

Status Quo

PFOA and related substances shall not be manufactured nor placed on the market in the EU after July 4th, 2020.

Articles or mixtures must not contain more than 25ppb (=µg/kg) PFOA respectively in total 1000ppb¹⁰ (=1ppm=1mg/kg) of the totality of precursors.

Exemptions for Firefighting Foam Agents:

Firefighting foam concentrates that were placed on the market before 4 July 2020 and which are exceeding the above limits may in future only be used until 4 July 2023.

The statement that firefighting foam agents would be banned from use soon is simply wrong!

Impact of the PFOA Regulation on foam uses

If after 4 July 2020 stocks exceeding the above thresholds are replenished with new firefighting foam concentrates in compliance with the requirements of (EU) 2017/1000, the resulting mixture may only be used if also meets the thresholds.

Storage containers and media-carrying parts (i.e. pumps, tubes, hoses, ...) on trucks, trailers or in

systems must be exposed to an intense technical cleaning procedure or have to be replaced to not contaminate new filled foam concentrate beyond the acceptable limits¹¹.



Safety advice:

If a firefighting foam concentrate has been stored in non-disposable technical equipment, all parts of this equipment having or having had contact with the firefighting foam concentrate must be thoroughly cleaned and the cleanliness tested before they can be refilled with new firefighting foam concentrate!

Please note that any contamination of new foam extinguishing agent concentrate by residues of PFOS- or PFOA-contaminated predecessor products beyond the maximum permissible content will render the new product unusable immediately!

Disclaimer

All information given in this technical information is based on our best knowledge at the time of this revision. This Technical Information remains subject to alterations and revisions. Please do not hesitate to contact us for the most recent edition.



Safety Advice: Please note this technical information is a general recommendation, which cannot not replace an in-depth technical advice considering the specifics of the situation and conditions on site!



Dr. STHAMER HAMBURG

Main Site Hamburg

Liebigstraße 5
D-22113 Hamburg
Tel.: +49 (0)40 73 61 68-0
Fax: +49 (0)40 73 61 68-60

Sales Office Hannover

Hartenbrakenstraße 54
D-30659 Hannover
Tel.: +49 (0)511 768 358 45
Fax: +49 (0)511 768 358 46

Sales Office Jena

Carl-Pullrich-Strasse 1
07749 Jena/Germany
Tel.: +49 (0)3641 63538-57
Fax: +49 (0)3641 63538-59

Office Frankenthal

Siemensstraße 4
D-67227 Frankenthal
Tel.: +49 (0)6233 3796 – 605
Fax: +49 (0)6233 3796 – 622



info@sthamer.com
www.sthamer.com

¹⁰ This threshold is a sum parameter i.e. the content of all possible precursors shall not exceed the given limit.

¹¹ This affects the cleaning for the purpose of meeting legal requirements with respect to contamination with PFOA and its

precursors. The requirement to clean up systems and devices for avoiding negative interactions between two foam agents in accordance with foam manufacturer instructions remains unchanged.