

PFAS



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TREND AND DECISION IN UE & USA

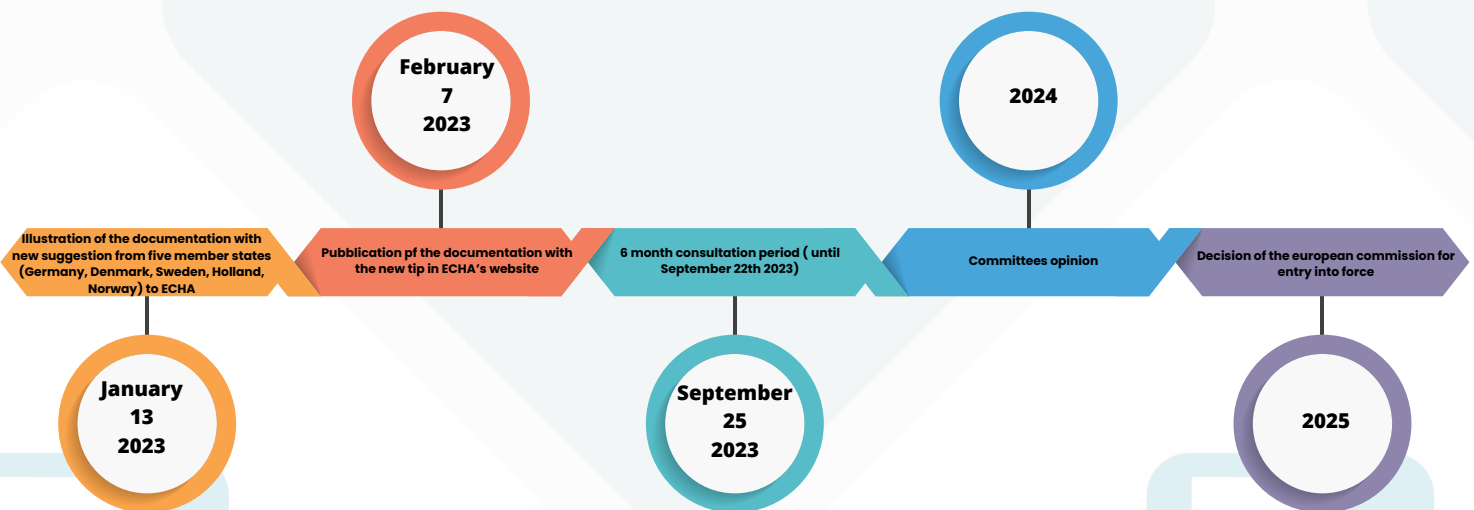
Alkyd perfluorinated, or polyfluorinated substances (PFAS), are organic compounds containing fluorine used in the production of various industrial and consumer products, for example they give to fabrics the right resistance to high temperatures or they make paper resistant to fats and water. They are also used in the production of fire-fighting foams, as well as in a wide range of a consumer products, such as food packaging, carpets and kitchen utensils and even in the aerospace, automotive and electronic industrial sectors.

Unfortunately, their manufacture and use have led to a diffusion of their presence in the environment and, due to their mobility and persistence, depending on the specific chemical structure, they can accumulate at different levels in human's tissues, animals and plants.

On June 15th 2020, the European Union, under the REACH legislation, imposed content limit for PFOA (a type of PFAS) and its isomers; some European national legislations provide limits for paper cardboard objects in relation to specific molecules and total fluorine content. In Europe, in 2022, specific limits were introduced for PFAS in food.

Restriction related to PFAS have been submitted by five EU member states to ECHA (European Chemical Agency). The documentation with the new proposal is still in approval.

Below the timeline:



In the USA, FDA recommendations have been published to reduce the use of PFAS, with an invitation to use only listed substances; the position of the individual States is much stricter; some states (e.g. Vermont) have totally banned the voluntary use of perfluorinated substances.

The restrictions in place in the USA are very strict and imply the evaluation of the presence in MOCA of both the total fluorine content and specific perfluorinated compounds, including their salts and isomers; These tests imply the need to perform screening analysis associated with instrumental libraries produced by laboratories that contain more than 10,000 compounds.

In events and webinars organized by the American authorities, since EPA considers as PFAS over 10,000 substances (Per- and Polyfluoroalkyl Substances (PFAS) | US EPA), the screening approach was considered mandatory; The "dogma" of the technical tables is:

UNTARGETED TESTING IS THE NEW TARGETED TESTING



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HEADQUARTERS AND LABORATORY

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WHY RELAY OF FOOD CONTACT CENTER

PFAS are substances with very variable characteristics; they can be volatile, semi-volatile and non-volatile. It is therefore necessary to use, in TARGET and UNTARGETED mode, the HS GC-MS, GC-MS and LC-Q-TOF techniques for non-volatile molecules. ECHA confirmed this need for MOCA by publishing an Annex to the PFAS restriction proposals. For these type of compounds, in order to obtain a valid untargeted testing, it is necessary to own specific libraries and high definition instruments like the LC-Q-TOF (following the standard CEN / TS 15968 : 2010), which can perform screening based on the exact mass of the molecules. Food Contact Center has developed a useful library that contains more than 10,000 fluorinated compounds, by using the LC-Q-TOF technique (high definition spectrometer). The library also contains MS-MS spectra of numerous molecules (EPA 537 list, ADONA, GENX...) for the quantitative targeted analysis.

THIS IS THE FIRST LABORATORY THAT IS CARRYING ON THESE SCREENING TESTS INTO ACCREDITATION, ACCORDING TO EN ISO 17025, THANKS TO THE KNOW-HOW AND THE LIBRARIES DEVELOPED.

PM/Ref. N° (classe)	CAS RN	NAME	Molecular Formula	Massa esatta
PFCA	335-67-1	Perfluorooctanoic acid	C ₈ HF ₁₅ O ₂	414,068388
PFCA	4234-23-5	Perfluoroundecanoic acid	C ₁₁ HF ₂₁ O ₂	564,0909072
PFCA	141074-63-7	Perfluoropentadecanoic acid	C ₁₅ HF ₂₉ O ₂	764,1209328
PFCA	57475-95-3	Perfluoroheptadecanoic acid	C ₁₇ HF ₃₃ O ₂	864,1359456
PFCA (Perfluorinated Carboxylic Acid)	375-22-4	Heptafluorobutyric acid	C ₄ HF ₇ O ₂	214,0383624
PFCA derivatives	2706-90-3	Pentanoic acid, nonafluoro- (TSCA, NDSL, ENCS, AICS)	C ₅ HF ₉ O ₂	264,0458688

THE FOOD CONTACT CENTER'S BOOKSHELVES WERE DEVELOPED IN COOPERATION WITH SCIEX

