



Bundesanstalt für Arbeitsschutz
und Arbeitsmedizin

PFAS under REACH

Universal Restriction Proposal

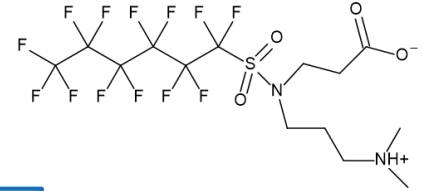
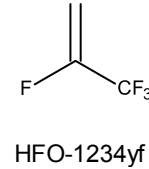
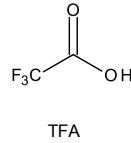
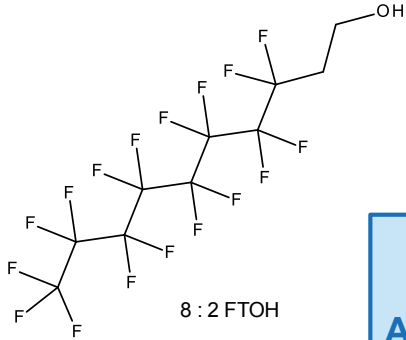
Dr. Frauke Averbeck

Content

- **PFAS – Definition and concern**
- **F-Gases/refrigerants**
- **The foreseen universal PFAS restriction**



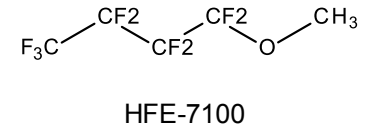
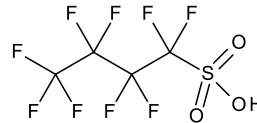
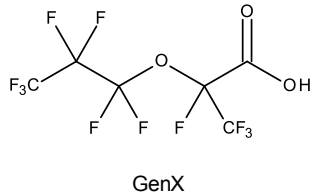
PFAS (working) definition



PFAS = Per- and polyfluoroalkyl substances

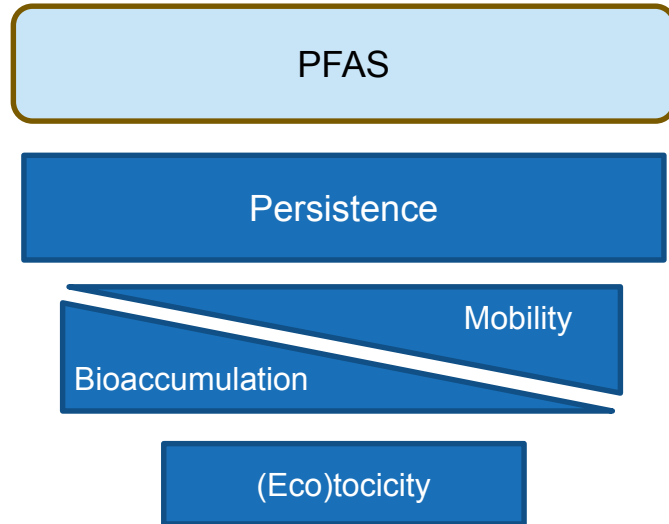
All substances with at least one fully fluorinated -CF₂- or -CF₃-group (without any H/Cl/Br/I-atom bound to it)

5,000 – 10,000 different PFAS



<https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/terminology-per-and-polyfluoroalkyl-substances.pdf>

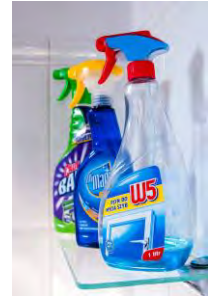
PFAS – properties



Main concern:

- All PFAS either are persistent themselves or can be degraded to persistent PFAS (e.g. PFCAs, TFA, etc.)
- Forever chemicals: remain in the environment for decades

PFAS Uses



F-gases



- Some PFAS used as refrigerants are F-gases
- F-gases: Global warming vs. other concerns
- EU F-gas regulation

F-gases

Climate

Environment/health

Contribute to
global warming

Contribute to
effects on health and
environment e.g. through
substances that precipitate
with rain (TFA)

Regulated in
F-gas Regulation

To be included in the
restriction proposal for
PFAS



„Old“ F-gases

„New“ F-gases (e.g. HFOs)

F-gases and working definition

PFAS

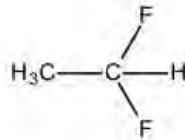
All substances with at least one fully fluorinated $-CF_2-$ or $-CF_3$ -group (without any H/Cl/Br/I-atom bound to it)



R-32

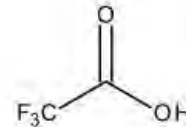


R-13

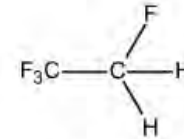


R-152a

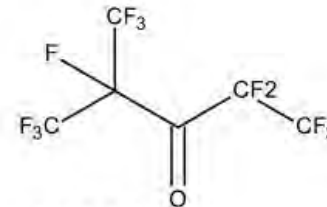
Out of scope



TFA



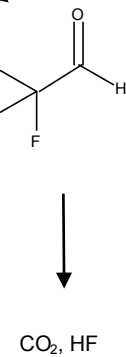
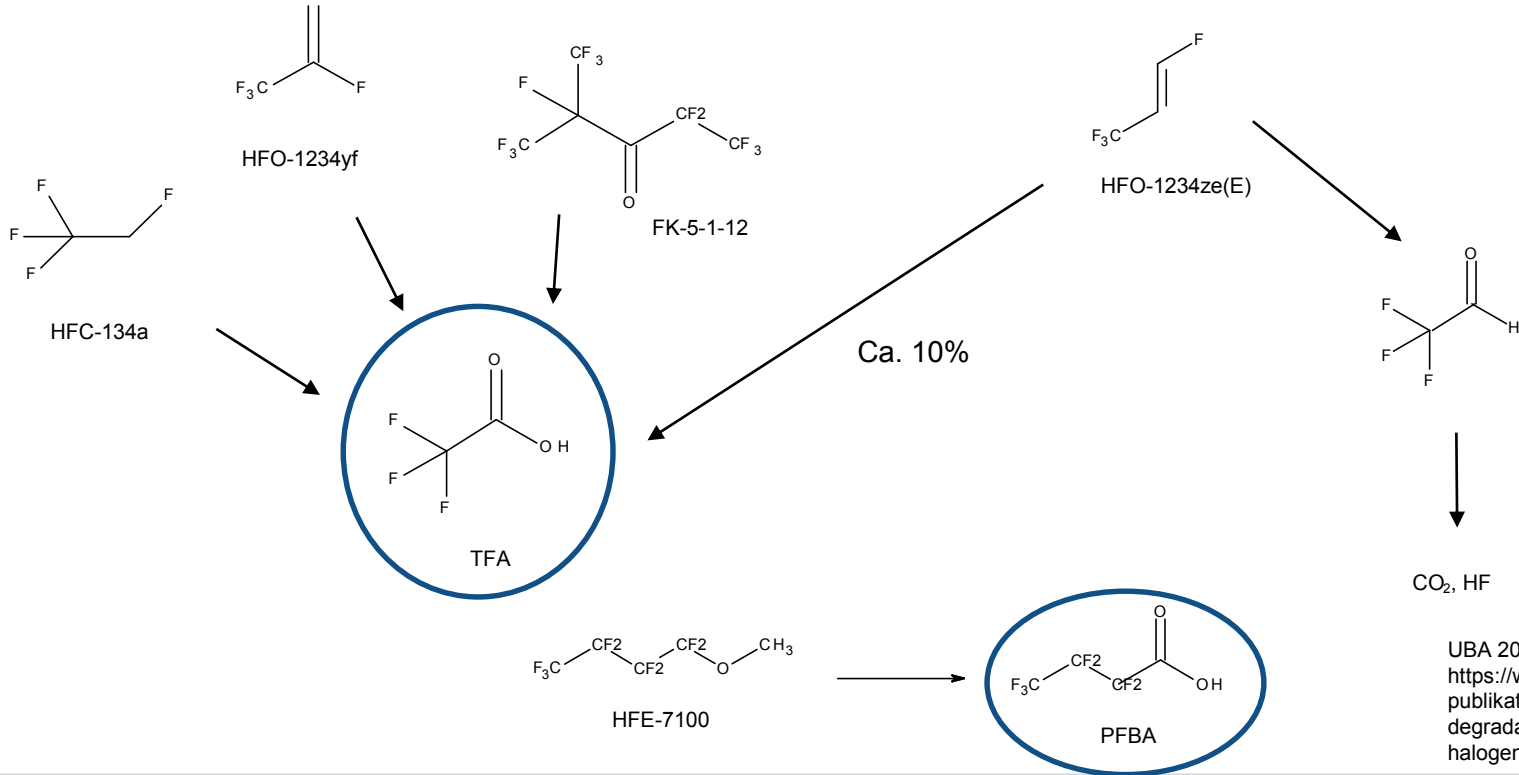
HFC-134a



FK-5-1-12

In scope

F-gases degradation



CO₂, HF

UBA 2021:
<https://www.umweltbundesamt.de/publikationen/persistent-degradation-products-of-halogenated>

TFA - Concern

- **High persistence**

- TFA remains in the environment for decades

- **High water solubility**

- Formation in atmosphere => findings in surface water, drinking water supplies, tap water

- concentration is increasing

- **Hazard/Toxicity**

- Indication of reprotoxic properties

Universal PFAS restriction

Spalte 1	Spalte 2
PFAS – all substances with at least one fully fluorinated -CF ₂ - or -CF ₃ -group (without any H/Cl/Br/I-atom bound to it)	<ol style="list-style-type: none">1. Shall not be manufactured and/or placed on the market and/or used as substances as such, in other substances, in mixtures and in articles in concentrations above x% from [date].2. [Derogations without conditions]3. [Derogations with conditions]4. [Further provisions]

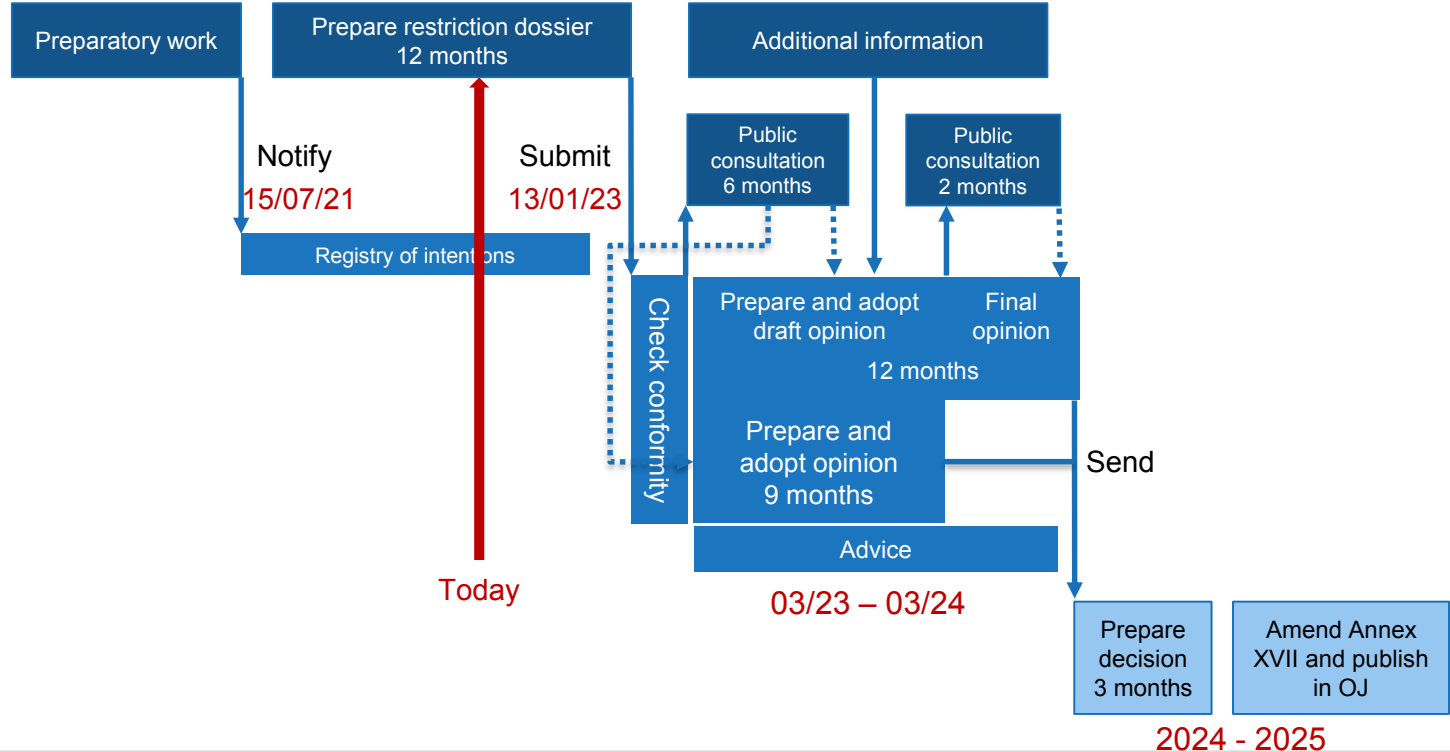
⇒ **Prohibition of all uses of PFAS unless concentration limit is met or use is exempted**

Timeline

Actors



Steps of the process



Summary

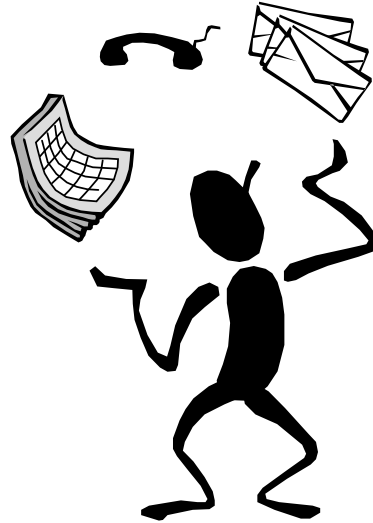
– PFAS

- Remain in the environment for decades (persistence) or
- degrade to other persistent PFAS
- Can accumulate and/or are mobile in the environment and hence transported to remote areas

– F-gases

- Are in scope of the foreseen restriction if working definition is met (chemical structure) and
- if they degrade to TFA or other persistent PFAS
- Derogations under consideration

Thank you very much for your attention



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