

Restriction on the manufacture, placing on the market and use of Per- and Polyfluoroalkyl substances (PFAS)

European Plastic Pipes and Fittings Association (TEPPFA) Comments to Annex XV restriction report

Executive summary

The European Chemicals Agency invites interested parties to submit scientific and technical information on the manufacture, placing on the market and use of per- and polyfluoroalkyl substances (PFAS) by 25 September 2023. Of particular interest is information relevant to the risks, socio-economic aspects, and alternative substances.

TEPPFA, The European Plastic Pipes & Fittings Association, has been founded in 1991 with headquarters in Brussels. TEPPFA's 14 multinational company members and 15 national associations across Europe represent 350 companies that manufacture plastic pipes and fittings and around 65% of EU market share.

TEPPFA members' final products have an annual production volume of 3 million tonnes directly employing 40,000 people with €12 billion combined annual sales. TEPPFA members' final products are subdivided into two application groups: above ground systems for hot and cold water, surface heating and cooling, waste water discharge and rainwater drainage, and below ground systems for sewers, stormwater and drainage, drinking water and gas supply and cable ducts.

TEPPFA welcomes the opportunity to share its views on the PFAS REACH Restriction Annex XV report and the potential impacts this proposal could have on the European plastic pipes and fittings industry.

This is a 1st TEPPFA sectoral submission to the public consultation on the PFAS draft restriction.

Based on an internal survey by TEPPFA with its members, a mapping of fluoropolymers and non-polymeric PFAS uses in our sector has been conducted.

Our sector primarily relies on several fluoropolymers (PVDF, ECTFE, PTFE, FKM, FFKM, ...), for a diverse range of critical applications, with a total of about 20 identified uses.

	manufacturing equipment	gaskets, diaphragms, membranes, O-rings	measurement & control instruments	pipes, fittings & valves	compression sleeves
PTFE	X	X	X		
FKM		X	X		
FFKM		X	X		
PVDF			X	X	X
ECTFE				X	

PTFE is used as coating, lubricant or processing aid in the manufacturing equipment/process for extrusion of pipes or injection moulding of fittings.

PVDF is used in plastic pipes, fittings and valves as well as sleeves and components for measurement and control instruments.

ECTFE is used in plastic pipes, fittings and valves, either directly for manufacturing pipes, fittings and sleeves for building & construction and chemical industry applications and in piping system sub-components (gaskets, membranes, O-rings, ...)

FKM and FFKM are used in components of plastic piping systems (gaskets, diaphragms, O-rings) and in components of measurement and control instruments.

Fluoropolymers are classified as Polymers of Low Concern (OECD Definition),

The environmental and toxicological profiles of fluoropolymers are distinctly different to the majority of other non-polymeric PFAS which are lower molecular weight substances. Fluoropolymers do not display the environmental and toxicological profiles associated with some PFAS that could be considered of concern. Hence, provided that the use of PFAS low-molecular weight processing aids during production of fluoropolymers is restricted, we support the idea of the polymer industry to evaluate fluoropolymers separately from other PFAS and even to take fluoropolymers out of the restriction.

Fluoropolymers used in our sector are primarily industry-only uses and professional uses where the risk for workers/operators is adequately controlled and applications not intended to end up in consumer products/articles.

Currently, most of these uses cannot be readily substituted by viable alternatives offering the same key performances (mainly durability, high thermal and chemical resistance, resistance to friction, resistance to corrosion, pressure, purity and creep resistance...) delivered by fluoropolymers.

As regards the identification of fluoropolymer uses and whether the proposed time-limited derogations do apply, although some uses seem to be generically mentioned in major sectors such as “chemical industry”, “construction products”, “petroleum and mining”, “electronics and semiconductors”, it is most of the time unclear whether our specific applications fit into the description of those uses. This is for example the case for drinking water piping systems conveying drinking water to the general public. Due to that legal uncertainty, we consider that ECHA should confirm whether the current proposed derogations actually apply to the uses identified by our sector or integrate our sector uses in a more precise way.

We also would like to emphasize that most of these uses are indispensable to reach the objectives set out in various EU policy initiatives such as the new Industrial Strategy (chemicals industry), the European Chips Act (semiconductors/electronics) or the EU Green Deal... which rely on the performance and functionality of these fluoropolymers.

Additionally, for the assessment of alternatives it is not enough to just search for a new suitable material. For piping systems (one system consists of > 5000 individual components developed over the last 25 years), the on-site jointing, installation and operational conditions need to be also considered.

Furthermore, we are working within a heavily regulated field (EU & national drinking water regulations, material regulations, testing protocols) which has a huge impact on the timeline since certification of alternatives takes years and only few official certificated laboratories can be selected for this process.

In our opinion, the derogation timelines are therefore too short in view of the required discovery and implementation of viable alternatives for most fluoropolymer uses identified in our sector. TEPPFA members and industry are continuously looking for innovative materials for their applications. Until now, no viable alternatives to fluoropolymers could be found with the same Key Performance Criteria (KPCs).

In conclusion:

An unlimited derogation for fluoropolymers for complete piping systems (including components, control & measurement instruments, tools, welding machines) as well as for fluoropolymers used in industrial settings (manufacturing equipment in industrial plants) should be granted.

I. Mapping of uses of PFAS – Status quo

TEPPFA completed a mapping of uses of PFAS among its members, in strict compliance with EU Competition Law, to try and identify which fluoropolymers and non-polymeric PFAS - falling under the scope of the REACH restriction – are intentionally used in the products we manufacture (i.e. rigid plastic pipes & fittings) or as components of piping systems (incl. sealing materials/elastomers, liners for pipes, sensors, valves).

Since fluoropolymers might also be used in the extrusion/injection molding equipment needed for manufacturing plastic pipes and fittings, the survey also encompassed the use of PFAS in “manufacturing equipment”. The survey also tried to address if PFAS were used as additives in the resin formulations supplied by plastic resin manufacturers upstream in the value chain.

Not to forget that fluoropolymers are also used in tools/equipment needed to install or weld pipes and fittings.

Additional confidential information might be further provided directly by TEPPFA members and their suppliers in their own detailed submission to this PFAS consultation.

I.A. PFAS uses in the EU plastic pipes & fittings industry

The following materials are fluoropolymers known to be used in our industry: PVDF (Polyvinylidene fluoride), PTFE (Polytetrafluoroethylene), ECTFE (Ethylene chlorotrifluoroethylene), FKM & FFKM (Fluoro-elastomers), PFA (Perfluoroalkoxy) for professional and/or industrial uses. These substances belong to the fluoropolymers group of PFAS.

The mapping of uses in our sector aggregated by fluoropolymer type

PFAS Used Substance Name	PFAS Used EC number	PFAS Used CAS number ³	PFAS type	KPC (Key Performance Criteria)	Field of application (dropdown list)	Industrial, Professional, or Consumer Use	Identified use by ECHA & Potential derogation?	Description of the product (short)	Application
PVDF (EC #: 607-458-6; CAS#: 24937-79-9)			polymer	chemical resistance	petroleum (oil & gas) & mining	professional/in dustrial	Petroleum & mining Yes	multilayer plastic pipes for the conveyance of hydrocarbons	Pipes
			polymer	chemical resistance	building and construction	professional	No	polymeric sliding collar / sliding sleeves for press fittings (Hot & Cold applications)	Sleeves
			polymer	chemical resistance	building and construction	professional	No	Fitting for Sanitary / Drinking Water System	Fittings
			polymer	chemical resistance	chemical industry	industrial only	chemical industry No	pipes, fittings, valves	Pipes/Fittings/Valves
			polymer	chemical resistance	chemical industry	industrial only	chemical industry No	components of measurement (e.g. flowmeters) and control (temperature and pressure sensors) instruments in chemical applications	Sub-Component
			polymer	High purity (for ambient and hot Ultra Pure Water)	electronics and semiconductors	industrial only	electronics and semiconduc tors Yes	pipes, fittings, valves	Pipes/Fittings/Valves

PFAS Used Substance Name	PFAS type	KPC (Key Performance Criteria)	Field of application (dropdown list)	Industrial, Professional, or Consumer Use	Identified use by ECHA & Potential derogation?	Description of the product (short)	Application
Ethylene Chlorotrifluoroethylene (ECTFE) - EC#: 25101-45-5)		chemical resistance	chemical industry	industrial only	No	pipes, fittings	Pipes/Fittings
PFA	processing aid	chemical & T° resistance	building and construction	professional	No	Drainage Pipe and Fitting	Pipes/Fittings
FKM	polymer	chemical & T° resistance	Industrial-, Renewable Energy-, Oil applications	professional/industrial only	No	O-Rings	Sub-Component
	polymer	chemical & T° resistance	chemical industry	industrial only	No	Sealing (gaskets) in piping systems	Sub-Component
	polymer	chemical & T° resistance	chemical industry	industrial only	No	O-Rings in measurement and control instruments	Sub-Component
FFKM	polymer	chemical & T° resistance	chemical industry	industrial only	No	Sealing (coating for O-rings and membranes) in valves and measurement and control instruments	Sub-Component

PFAS Used Substance Name	PFAS type	KPC (Key Performance Criteria)	Field of application (dropdown list)	Industrial, Professional, or Consumer Use	Identified use by ECHA & Potential derogation?	Description of the product (short)	Application
Propane, 1,1,1,2,2,3,3,3-heptafluoro-3-[(1,2,2-trifluoroethenyl)oxy]-, polymer with 1,1,2,2-tetrafluoroethene (EC#: 682-550-7, CAS#: 26655-00-5)	polymer	lubrication	lubricant	industrial only	No	coating of production tooling	Manufacturing tool
1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene (EC#: 9011-17-0, CAS#: 618-470-6)	processing aid		building and construction	industrial only	No		
n.a. Confidential Supplier Information	processing aid		building construction, Drinking Water	professional	No	Multilayer Pipe (Sanitary, Drinking Water)	Pipes

If we present the mapping of uses aggregated by application (pipes, fittings, valves & sleeves, manufacturing tool, equipment for pipe installation, sub-component):

- For **pipes, fittings, valves & sleeves**, fluoropolymers are used for the conveyance of drinking water to the tap, the conveyance and dosage of chemicals (in industrial processes), for the conveyance of hydrocarbons in the Oil & Gas sector, Hot & Cold & Drainage applications.

- In **manufacturing equipment** (for example, for extrusion of plastic pipes or injection molding of fittings), PTFE is used in sealings, linear bearings or surface coatings and is often associated with lubrication/friction reduction properties. The lubrication properties might be beneficial in high-speed lines for multi-layer co-extruded pipes.

- In **Sub-components of piping systems**: PTFE & FKM are used in O-Rings coatings, PTFE also in components of equipment needed to install pipes. PTFE and other PFAS can be used as Processing Aid (see also Annex XV Annex A.2.1.5.2 Polymer Processing Aid – Pipe extrusion of HDPE).

The following Table (in “Annex A – Manufacturing and uses” of PFAS draft Annex XV proposal - presents an overview of the PFAS applications.

Table A.1. Overview of PFAS applications and the level at which they were researched.

PFAS applications			
PFAS manufacture	Textile, upholstery, leather, apparel and carpets (TULAC)	Food contact materials and packaging	Metal plating and manufacture of metal products
Consumer mixtures	Cosmetics	Ski wax	Applications of fluorinated gases
Medical devices	Transport	Electronics and semiconductors	Energy sector
Construction products	Lubricants	Petroleum and mining	Waste stage PFAS applications
Laboratory equipment & filtration	Plant protection products and biocides	Chemical industry	Firefighting foam
Medicinal products	Plastics (other than packaging) and rubber/elastomer production (including flame retardants)	Pyrotechnics	Personal care products other than cosmetics
Fracking (currently hardly applicable in EEA)	Immersion cooling (currently hardly applicable in EEA)	Defence industry	Printing inks
Cement industry	Professional cleaning and polishing	Other niche applications	Uses (yet) unknown

- Green uses are researched in detail
- Blue uses are researched in general
- Orange uses not researched in detail
- Purple use: Separate restriction proposal

Considering that table, it is clear that PFAS applications which might apply to our sector (such as “chemical industry” and chemical processes in various industries) have not all been researched in detail.

Even for applications which seem to have been researched in detail, they are “generically” described as “chemical industry”, “construction products”, “petroleum and mining”, “electronics and semiconductors” without a clear description of the uses.

Scanning through the draft Annex XV report and its Annex A for “pipe”, the following could be identified:

i. **“Chemical industry”**: With regard to “chemical industry” applications, Annex XV Annex A.3.2.1.1. Fluoropolymers, Table 12 mentions “Heavy-wall solid pipes & fittings”. With regard to “Engineering” applications, the same table only mentions “Coatings for pipes, fittings”. For both applications, there is no specific description of the specific uses.

ii. **“Construction Products”**: Regarding “construction products”, although this major use sector has been researched in detail, there is no mention of “plastic pipes, fittings or sleeves” used for sanitary, hot & cold applications in Annex A Table A.57 (Identified PFAS uses, technical function and examples of PFAS in building materials/construction products based on literature and stakeholder input)

iii. **Energy sector**: Some uses of PFAS related to the “**Energy industry**” have also been identified in Annex A Table A.54 (Identified uses and application of PFASs in the energy industry identified by stakeholders), such as gaskets, tubes, inline of pipes and tanks for electrolysis technologies related to hydrogen production.

With regard to **Oil & Gas applications**, Annex A Table A53 (PFASs uses in the energy industry – literature and publicly available sources, complemented by a stakeholder) mentions “equipment: gaskets, tubes, inline of pipes/tanks. Wires and capacitors”. Annex A section A.3.16.1.3. further

details the uses of FPs in the petroleum industry.

iv. Food Contact Materials

In Annex A Table A.81, the use of PFAS in "Food Contact Materials" mentions "PVDF used in industrial food processing & food transport equipment, for solid & lined pipes, fittings, valves ... for fluid-handling applications". Drinking water piping systems for water treatment/disinfection and distribution to the general public seem to be out of scope of the derogation.

v. Commercial fluoropolymers' uses

The following commercial fluoropolymers' uses are mentioned in Annex A, Appendix A.3.2 "Fluoropolymer applications, including fluoroelastomers", Table A.75 Non-exhaustive overview of common commercial FPs and their applications"

- PTFE used in lubricants/construction products (pipes & fittings)
- ECTFE used in lubricants/construction products (pipes & components)
- PVDF used in other sectors (pipe and pumping applications)

This means that a specific description of our applications is often lacking, which might lead to the conclusion that, for those uses, no derogation would apply, and a ban would enter into force 18 months after publication of the restriction.

I.B. Provisional & time-limited derogations listed in the proposed PFAS restriction, which might be relevant for our sector

Analysis of derogations by sector / use

PFAS time-limited derogations	Ban after # years after EIF	Potential derogation	Relevant for our sector	Derogation	Only for	Includes
<i>Metal plating & manufacture of metal products</i>						
hard chrome plating	6,5	X	Y	"5 v"		
<i>Food Contact Materials for the purpose of industrial & professional food & feed production</i>	6,5		Y	"6 a"	Fluoropolymers & PFPE	pipng & tubing for DW applications; seals, O'Rings, tubing & pipes, expansion joints, valves, lubricants
<i>Lubricants</i>	13,5		Y	"5 s"		use under harsh conditions, no harmonised definition
<i>Petroleum & mining</i>	13,5		Y	"6 f"	Fluoropolymers	
<i>Semiconductors</i>	13,5	X	Y	"5 ee"		
<i>Polymeric PFAS used as processing aid for (non-PFAS) polymers/plastics</i>	1,5		Y	None		
<i>Metal plating - other applications</i>	1,5		Y	None		
<i>Electronics</i>	1,5		Y	None		
<i>PVDF (use of polymerisation aids in the production of)</i>	1,5		Y	None		
<i>PTFE (use of polymerisation aids in the production of)</i>	1,5		Y	None		
<i>FKM (use of polymerisation aids in the production of)</i>	1,5		Y	None		
<i>PVDF</i>	1,5		Y	except if used in sector derogations		
<i>PTFE</i>	1,5		Y			
<i>FKM</i>	1,5		Y			
<i>ECTFE</i>	1,5		Y			

TEPPFA assumes that the only derogations which do apply to our sector uses are related to “lubricants” (derogation 5s), “semiconductors” (derogation 5ee) and “petroleum & mining” (derogation 6f).

As mentioned above, it is not clear whether other above-mentioned derogations (in green) – which might be relevant for our applications (uses/sub-uses) – do effectively apply to our sector uses. For example, in the hard chrome plating derogation, pickling [for which pipes are needed to convey pickling chemicals, e.g., concentrated HNO₃, HF, HCl, H₂SO₄ and mixtures thereof] is not identified although it is part of the hard chrome plating process [to remove oxides formed on the surface of the plate]. Hence is this use covered by the related derogation?

The same comment applies to drinking water piping systems. Does this potential derogation cover all drinking water piping systems, including those for water treatment/disinfection equipment and those distributing drinking water to the public or just the ones for “food contact materials for the purpose of industrial food & feed production”.

Even if any derogation would apply, considering the complexity of developing new suitable piping systems and components and their importance for EU policy initiatives such as the new Industrial Strategy (chemicals industry), the European Chips Act (semiconductors /electronics) or the EU Green Deal, the proposed derogation timelines are too short. TEPPFA members and industry are continuously looking for innovative materials for their applications. Until now, no viable alternatives to fluoropolymers could be found with the same KPCs...

In conclusion:

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Editor's Note:

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