

We welcome the opportunity to comment the proposal of the restriction for the whole group of per- and polyfluoroalkyl substances (PFAs). Our technology industries, major downstream users and article manufacturers are fully committed to reduce the content of hazardous substances in the products to support a more circular economy, according to European Union objectives.

Electrical installation equipment are mainly products based on mechanical and/or electrical component that commonly contain fluoropolymers which have been added recently into the definition of PFAs. In case of a large and rapid restriction of all group of PFAs including fluoropolymers, our industries will be exposed to a major risk in our supply chain additionally to a risk on the market as product technologies could not anymore be available. Electrical installation equipment are the key to develop electrical infrastructure in order to support the "EU green deal" transition.

Regarding current applications, PFAs uses are also not always known by downstream users and we have to collect information to our supplier and analyse the potential sustainable alternatives. There are several possibilities including a substitution proposed by the supplier or the validation of new solution but the restriction could also lead to the complete redesign of products. Also we do not know if supplier have reliable alternates that are economically viable and do not cost more harm than PFAs.

All those mandatory actions are clearly impacting our compagnies and need time to be realised. Some products are on the market since decades and ensure safety of electrical installations. It is not an easy task to guarantee equal performances with substance-free products, knowing that our products are installed to assure safety for a long time (over 20 years).

As downstream users we clearly consider this restriction proposal and we have to continue to work with our suppliers to have a better understanding of each impact of this restriction. For instance these are some of the applications where there is a huge impact on electrical installation equipment:

- PTFE as metal surface treatment and PTFE as plastic surface treatment
- Plastic additive (Flame Retardant)
- Plastic additive (friction, processing aid additive...)
- PTFE/PVDF
- Specific lubricants
- Cables insulation and connectors PTFE/PVDF/ PFA/MFA
- Electronic components and batteries

For all this applications we recommend a longer transition period (5 years at least) and apply a 5 or 12 years derogation for each of our applications to have the time to undertake studies on alternatives available on the market and instigate redesign and adaptation of electrical installation equipment. Without this longer transition period or derogation, it will be extremely challenging to find/validate new solutions. This could generate bigger issues, especially on safety and environment.

Find below more details about usage of PFAs in each application.

PTFE as metal surface treatment and PTFE as plastic surface treatment:

PFAS (mainly fluorinated polymers) are used as surface treatment for tribological properties. It allows to lower friction between parts in lots of mechanisms which are critical for electrical applications. In circuit breakers eg, which are safety critical products, the capability to open the circuit on electrical faults is critical for people and equipment safety. The opening speed is the main factor and PFAS surface treatment is a key element of the complex mechanical chain which ensures this speed and the robustness. The electrical industry has years of experience with this solution and can guarantee that this type of mechanism will work properly and ensure safety, even after 20 years without any action. We have very little experience and feedback on viable alternative solutions to guarantee the same level of performance over time. The alternative solutions proposed by the restriction dossier do not targeting the same properties. Hardening treatment was evaluated in some minor cases, but the friction behavior is lower and needs external lubrication. It cannot be generalized. The amount of fluorinated polymer involved in this use case is quite small but critical. Moreover, in lots of cases, those metallic/plastics parts can be recovered at the end of product life for specific treatment, avoiding any dissemination in the environment. Our industry needs at least a minimum of 12 year derogation to evaluate other alternative solutions and have sufficient and robust feedback and data to guarantee the same safety level. In case of safety issues and no alternative is validated, a permanent derogation should be granted.

Plastic additive (FR):

Flame retardancy of plastics used in electrical products is key and critical as those materials must prevent fire propagation in case of ignition due to electrical defaults. 1/4 of fire have electrical defects root cause. One can easily understand that fire propagation just after ignition is key for safety. Those last years, the number of flame-retardant solutions for plastics decreased under regulatory pressure. A flame-retardant system for plastic is specifically designed for the standard test to target. In our domain, UL94-V or IEC 60695-2-12 is compulsory and is very difficult to achieve. For some plastics such as Polycarbonate, the standard test can only be achieved with a complex FR system in which one of the components (dripping agent) is a PFAS. The amount of PFAS in the formulation is very low (a fraction of percent) but key for a pass. For safety reasons, we cannot degrade the FR standard tests severity level and the plastic industry needs time to develop new FR systems which is a very long process. The very low level of fluorinated polymer in the formulation, combined to the difficulty to develop alternative solutions means that we need at least a 12 year derogation for that application.

Plastic additive (friction, processing aid additive...):

As for metals and plastics surface treatment, friction behavior of plastic parts in mechanical mechanisms is critical for people and equipment's safety. As explained for PFAS metal and plastics surface treatment case, our experience with current solutions enables us to guaranty the safety of our products for at least 20-30 years. Finding an alternative solution takes time if we want to guarantee the same reliability level. Some plastics show intrinsic tribological properties when others need additives to improve their friction behavior. Replacing additive plastics by intrinsic good friction polymers is not feasible in all applications. Alternative solutions proposed in the restriction dossier (siloxanes) are not relevant for applications because they can spread quite easily from the lubricated parts to the neighboring parts creating adhesion or electrical contact issues. MoS2 can be used as an alternative of PFAS in some plastics for better tribological behavior, but this must be validated and this takes time. A minimum 12 year derogation is required to cover raw material supplier investigations, evaluation at product level and long-term validation.

PTFE/PVDF:

Except already mentioned applications, fluorinated polymers are widely used when low friction is required. Alternative solutions exist such as POM but this creates other problems. PTFE parts are also used for their extremely good thermal properties. Lots of applications in electrical devices, close to electrical arc are using PTFE parts because of unique thermal resistance and processability. The low surface tension property of PTFE is also key for the dielectric behavior of products such as circuit breakers, ensuring people and equipment's safety.

Apart from the use in electrical products, the usage of PTFE is extensive in manufacturing machines and automatic lines allowing high production flow rates. Having to replace PTFE parts on industrial process could have an impact on production.

A minimum of 5 year derogation is required for classical applications and a minimum 12 year derogation (if not permanent) for dielectric and high temperature purposes when safety is required.

Specific lubricants:

In our industry we use lubricants for several application (product, manufacturing, ...), today ECHA proposal is to have a 12 year derogation we are supporting this proposal.

Electronic components and batteries:

As downstream users we support the position of electronic and batteries manufacturer.

EU semiconductor manufacturing accounts for 10 % of worldwide semiconductor manufacturing and GDP. Semiconductors are a key enabler of low carbon and energy efficient innovative solutions that reduce our dependence on fossil fuels and minimize emissions. Semiconductor's help reduce society's environmental footprint, by optimizing energy usage in transportation, manufacturing, services and consumer products. Semiconductors facilitate the transition towards a decarbonized economy while simultaneously contributing to an innovative and sustainable society to realize the EU's Green Deal objectives. The continued manufacture of semiconductors in Europe is not possible without the use of PFAS.

Cables insulation and connectors PTFE/PVDF/ PFA/MFA:

Fluorinated polymer insulated cables and wires are used when high temperatures and high lifetime is required (more than 20 years at 135°C). It is also used when hydrolysis, thermo-oxidation, stress cracking resistance is required. Alternative solutions proposed in the restriction dossier need to be evaluated, knowing that some properties such as flexibility are not in line with our mission profiles. Silicone insulated cables that could be used as alternative show issues with electrical contacts due to oligomers migration with a potential pollution of electrical contacts.

Fluorinated polymers are also used in high frequency cables and connectors due to their unique stable dielectric properties in those conditions. No simple alternative solutions are available for this application today. According to the situation, a minimum of 5 year derogation is required to evaluate alternative solutions ageing properties and probably a 12 year derogation is needed for high frequency applications.