GICAT
The French land defence and security industry association

25/05/2023

General comment in response of the PFAS Consultation

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Dear Sir/Madam,

The French Land Defence and Security Industry Association (GICAT) is a trade association created in 1978 and which today represents more than 420 members. A GICAT's detailed presentation is joined in annex.

GICAT has decided to respond to this consultation to express its great concern about the proposal restriction of Per-and Polyfluoroalkyl substances (PFAS) that strongly impact its members.

Non-polymer PFAS compounds are found in many types of formulations used by the defence industry, from coatings to greases, lubricants or hydraulic fluids. They confer **specific key properties required for reliability and thus user safety** in rough and demanding environments and are usually found in very low concentrations.

However, the purpose of this comment for manufacturers of pyrotechnic components, ammunition, rockets, missiles (1)… is to address our industry's specific uses of fluoropolymers, more specifically, PTFE (Teflon®), PVDF and fluorinated elastomer (Viton®). They are used extensively throughout our supply chains in the manufacture of many pyrotechnic mixtures and articles,in our industrial process (in particular as surface coating in direct contact with pyrotechnic compositions) and are essential for new technology development programmes across the sector

The most critical uses of these substances for the national defence interests is **to formulate pyrotechnic compositions** used in numerous devices and components where other materials would not satisfy the requirements. For example, the following applications are concerned: Countermeasures flares, heating devices, igniters, obscurants, propellants, tracers, tracking flares, underwater flares, explosive charge, warhead anti-tank system (2) etc.

While the uses of pyrotechnic applications are mentioned in the annex A as "fluorine containing oxidizers, primarily polymers, are extensively used in pyrotechnic compositions » (tables A1 – A77), they are not covered by the restriction dossier due to limited information available. **However, the ammunition and other pyrotechnic components impacted by the restrictions under consideration are essential to maintain the operational capabilities of our armed forces on land, sea and air.**

For this reason, GICAT decided to target and to develop its response to the PFAS consultation on these strategic and specific uses of fluoropolymers in our range of activities. Many other uses are also essential but are less specific and supported by other sectors of activities.

In the manufacture of pyrotechnic compositions for ammunition, granular PTFE, PVDF, HFP are mainly used.

- Low quantities are used each year per production site: few kilos to 5 tons maximum.
- No transformation nor chemical degradation of the fluoropolymers takes place during the manufacturing process (composition pre-mixing under wet conditions) (2).
- No emission of particles or dust occurs during the manufacturing process (composition pre-mixing under wet condition or dissolution in solvent).
- No waste or pollution of the water network results from the process.

(1) All definitions defined in the "Dictionnaire de la Pyrotechnie" / "Pyrotechnics dictionary" edition 7 published by GTPS
(2) Metal-Fluorocarbon based Energetic Materials by Ernst-Christian Koch from NATO Munitions Safety

- No emission of PFAs results from the ignition of the ammunition or pyrotechnic component. The combustion products are fluorometal, carbon and HF (2).

Fluoropolymers' characteristics, in particular their excellent resistance to thermal or chemical attacks, are perfectly adapted to severe environments as required for defence applications. Fluoropolymers also present an extremely low coefficient of friction which gives them an optimal compatibility with the high sensitivities of pyrotechnic substances or mixtures.

In addition, **fluoropolymers are the only molecules chemically compatible with all families of pyrotechnic mixtures which ensures the highest level of safety** during the manufacturing, the handling, the functioning and the storage of ammunition in all conditions.

For all these reasons, companies of the defence industry have been using fluoropolymers in pyrotechnic compositions and in components which are in contact with pyrotechnic compositions since the 1980s and **no extensive research for alternatives exists today.**

Subject to identifying substitute formulations with equivalent performances, the inclusion of fluoropolymers in the restriction would lead to a requalification for each case of use (ammunition and pyrotechnic components). The usual time to qualify a new formulation in one ammunition is around 10 years and the overall cost is assessed at several million euros.

In addition, this restriction would prevent the defence industry from honouring:
- the ammunition orders already committed for deliveries spread over several years (more than 10 years) leading to break contracts,
- the request of the French State to constitute stocks within the framework of the war economy (Military Programming Law 2024-2030 (LPM)).

Following this restriction, any sub-assembly already in stock (pyrotechnic or not, containing a fluoropolymer) awaiting to be integrated in ammunition or into another complex article to be placed on the market should be destroyed. In addition to the financial and technical impacts (for destruction of pyrotechnic products), national interests can no longer be respected.

All these points will be developed and documented in the other parts of the consultation by each GICAT's members concerned by pyrotechnic activities.

Nevertheless, fluoropolymers shall be considered as a distinct subset of PFAS related to chemical hazard. Fluoropolymers are inherently safe, non-mobile, non-bio accumulative and non-toxic. Fluoropolymers are different from other PFAS as they **do not share the toxicological and environmental profiles** associated with PFAS of concern. Fluoropolymers have a **unique set of physicochemical properties,** they meet OECD polymer of low concern criteria, and are considered to have **insignificant environmental and human health impact**.

Considering the safety and reliability benefits of fluoropolymer applications for the defence industry, and to prevent significant risks of wide-spread obsolescence for materials and processes, the very low PFAS emissions risk and initiatives being taken by the processing industry to further minimize emissions and closing the loop by implementing circular economy wherever possible, we request a **full exemption of fluoropolymers from the PFAS restriction proposal to maintain our major critical uses such as:**

- Formulation of pyrotechnic compositions contained in military equipment and ammunition components.
- Surface coating of processing tools and parts of ammunition in direct contact with pyrotechnic compositions.

Sincerely yours