

CECOD – POSITION PAPER

Consultation Per- and polyfluoroalkyl substances (PFAS)

CECOD is a European trade association of manufacturers of measuring and distributing equipment for mobility.

Members are typically companies involved in refuelling station equipment including liquid and gas fuel dispensers, dispenser components, electric vehicle chargers, point of sales, fuel management systems, tank gauging systems, payment, and price signs. We also have members who are manufacturers of industrial meters and systems for use with fuels, for example road tanker mounted equipment.

CECOD are active in the fields of safety, legal metrology, and environmental regulations. We are world experts for explosion safety on refuelling station forecourts, fuel measurement, petrol vapour recovery, tank gauging and leak detection with technical committee members having roles in the bodies which write the European standards and guides. We continue to expand our role and look to the provision of alternative energy sources at refuelling stations including electricity and hydrogen.



Consultation Response

• Summary

PFAS-based fluoropolymers, such as FKM, FFKM and PTFE, are widely used in seals, membranes and gaskets in the industry of fuel measurement and distributing equipment.

Today, PFAS and derived compounds have been used for decades in petroleum and explosive fuels (liquid and gas) distribution and measuring solutions, so such fuels could be brought safely to the market, to consumers and to the EU economy. It took over 15 years to secure the adequate compounds variation when unleaded fuels came to the market.

Alternative materials have been considered, but they do not match the chemical resistance and performance of PFAS-based materials in fuel or chemical environments.

While acknowledging the concerns surrounding PFAS-based fluoropolymers, a ban on PFAS-based sealing materials would have significant implications for the industry, as these materials are extensively used within equipment. Finding suitable alternatives that meet the stringent requirements for durability, chemical resistance, and temperature stability will be challenging, and at this time there is no guarantee that we will have a direct replacement solution in future.

The use of current non-PFAS materials could potentially impose a risk of fire and explosion safety, environmental air or soil pollution, loss of product quality, and risk continued compliance with EU regulations, and therefore is not a viable option.

Today, no substitute compound exists on market, nor has specialist of the gasket and sealing industry announced any kind of possible positive step towards an efficient and safe solution to replace the PFAS compounds used in our community.

Furthermore, the ban on PFAS-based fluoropolymers sealing materials could result in significant delays in the adoption of cleaner energy sources, consequently hindering the achievement of net-zero initiatives in the mobility sector. It is essential to consider the far-reaching impacts on the mobility sector when assessing the need for a concession for PFAS-based sealing materials.

PFAS-based fluoropolymers are firmly embedded in sealing materials and there is no risk of environmental pollution during operation. At the end of the product life cycle, when the products are dismantled seals must already be separated and sent to a separate recycling process.

A concession for our industry regarding PFAS based materials for sealing materials is already proposed in ANNEX XV for Fluoropolymer applications for petroleum. However, this requires to be extended for new fuels and energy sources. These new energy sources are often more aggressive than petroleum-based products and are not currently fully specified by European standards controlling composition. Therefore PFAS-based fluoropolymer sealing materials are critical to handle these applications in the absence of any current alternatives.

The unique properties of PFAS-based materials for seals, membranes and gaskets make them indispensable in various applications, and finding suitable alternatives is a complex task that will depend on polymer manufacturers. Subsequent test and trials must be done in our applications and industry. Until an alternative is found and fully verified a concession for our industry would be essential.

Background

The utilization of PFAS-based fluoropolymers in petroleum and distributing equipment is driven by their performance criteria, functions, and benefits. Some of the key properties that make fluoropolymer-containing materials indispensable in our industry include:

1. **Chemical Resistance:** fluoropolymer-containing sealants exhibit exceptional resistance to fuels, biofuels and a wide range of biofuel blends, solvents, and corrosive chemicals, ensuring the durability and integrity of petroleum and other fuel measuring and distributing equipment.
2. **Thermal Stability:** fluoropolymer-containing materials maintain their properties even under extreme temperature conditions, ensuring reliable performance over wide climate conditions.
3. **Compatibility:** fluoropolymer-containing seals are compatible with a wide range of materials commonly used in petroleum and other fuel distributing equipment, facilitating seamless integration and ensuring optimal system performance.

The selection of PFAS-based fluoropolymers sealing materials currently in use is based on decades of experience. This guarantees safe, leakage-free operation for personal, public and environmental protection including control of soil contamination and vapour emissions, preservation of safety-relevant functions during transport by road and rail, safety of refuelling stations, investment protection due to long downtimes, and low maintenance requirements.

The requirement for durable sealing materials for new energy projects is very high due to the properties of the new fuels. A manufacturer could be taking product liability risks in these projects if inferior sealing materials were substituted for PFAS-based fluoropolymers sealing materials.

Considering the applicable essential EU regulations on health and safety (including ATEX (2014/32/EU), ADR/RID, PED (2014/68/EU), the new Machinery regulation (2023/1230), and others), seals need to resist all existing fuels and newer fuels being introduced. Suitable tests have been defined in some of the industry harmonized standards (for example EN 13617 series), with test fluids selected to prevent possible explosions, and leaks of dangerous and environmentally unfriendly liquids and gases. Historically, the set of materials suitable to make long lasting adequate gaskets took many years to identify when the unleaded fuels were introduced three decades ago, and these subsequently had to be adjusted for bio-content, a task that took many years. Any seal changes require significant testing and trials, and experience has shown that significant time is required to be fully confident of their performance.

Application in our Industry

PFAS-based fluoropolymers find diverse applications in fuel distributing equipment due to their exceptional chemical resistance and unique properties.

The wide range of applications of these materials include:

- **Seals:** PFAS-based fluoropolymers (FKM, FFKM and PTFE) or fluorine rubber made of fluorinated elastomers are used in seals, gaskets, and membranes within hydraulic and pneumatic circuits.
- **Hose and Fittings:** PFAS-based fluoropolymers are utilized in the manufacturing of hoses and fittings to enhance durability and prevent leakage, ensuring the safe transfer of fuels from dispensers to the motorist's vehicles, or from road tankers to storage tanks.
- **Coatings:** PFAS coatings are applied to various fuel measurement and distributing equipment components to provide corrosion resistance and extend their service life.
- **Pressure/Vacuum vent valves** to prevent vapour release to the environment from fuel underground storage tanks when volatile fuels are stored.
- **Equipment approved for the transport of dangerous goods by road** in accordance with ADR/RID requirements including
 - Safety valves for over / under pressure release to prevent damage to the tank shell of road tankers and comply with air pollution control.
 - Safety valves for when a road tanker overturns,
 - 1st and 2nd closing devices on road tankers, and filling and dispensing couplings to avoid leaks during loading and unloading.
- **Measuring systems on road tankers and for fuel dispensers.** These fuels contain a wide variety of additives, especially for high-octane fuels, which require system tightness of the installation through high-quality sealing materials.
- **Measuring instruments and gas separation equipment** at refineries operating in accordance with legal requirements. This includes components for controlling the measurement processes as well as measures to comply with air pollution control by avoiding leaks and thus preventing hydrocarbon releases into the environment.
- **Dosing units** for the addition of dyes or additives to improve the product properties.
- **Applications of high-pressure gas meters** (up to 850 bar) and for new energy projects (hydrogen) or CO₂ storage. Here 100% of seals are fluoropolymer-containing materials.
- **Gasket or seals** to prevent flammable gas entry into electronics enclosures and ensure ATEX related safety requirements.
- **Seals used in sensors** used to detect fuel leakage and monitor fuel levels to prevent soil and water contamination.

The main concern in our industry is only related to materials used for seals, gaskets and membranes. A review of the sealing materials used in our industry showed that, depending on the product line, 60% to 100% of the seals used in a typical piece of equipment will be affected by a ban on fluoropolymers in the EU.

The range of applications for such materials is thus clearly limited to our industrial applications. The seals, gaskets and membranes are permanently installed in the systems and devices.

Alternatives assessment

The requirements for the sealing materials could be summarized as follows:

- Direct sealing by being in contact with fuels and other process media.
- Resistance to sudden pressure fluctuations (explosive decompression)
- Operating temperatures -50°C to 150°C
- Resistance to toxic and aggressive process media
- Resistance to various states of aggregation at (gaseous / liquid / supercritical) and high pressures
- Resistance to organic products and their mixture with petroleum products (biocontent including the impact of possible water contamination)

Alternative sealants, have been considered. As examples:

- Silicone-containing seals are completely unsuitable for use as they swell strongly in combination with mineral oils, and thus become unusable.
- Alternative elastomers, such as hydrogenated nitrile butadiene rubber (HNBR) and ethylene propylene diene monomer (EPDM), have been explored as substitutes for PFAS-based elastomers like FKM and FFKM. But these materials have limitations in extreme temperature or aggressive chemical environments.
- Thermoplastic Elastomers (TPE): TPE materials, including copolyester and thermoplastic vulcanizates (TPV), have been considered as alternatives to traditional elastomers, but they do not match the chemical resistance of PFAS-based elastomers in highly aggressive fuel or chemical environments.
- Polyurethanes (PU): Polyurethane materials have been considered but, their chemical resistance does not match that of PFAS-based materials in highly aggressive fuel or chemical environments.

Our industry is a user of such fluoropolymer-containing sealing materials and we do not manufacture seals ourselves. The data sheet specifications of the seal manufacturers are only an indication of performance and not always expedient. For product liability reasons product tests of seals in their application are necessary, and often are mandatory.

Our research has shown that there are no current suitable alternatives. As things stand today, it is not possible to judge when comparable substitutes for fluoropolymer-containing sealing materials will be available for our industry to use, or whether there may be no future substitutes at all.

- **Impact upon equipment manufacturers**

A ban on PFAS in fuel measurement and distributing equipment would have significant implications for equipment manufacturers.

The assessment and testing of alternative seals is only possible with personnel and additional capital.

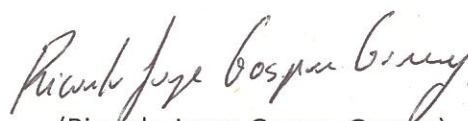
The use of alternative materials may require adjustments to manufacturing processes. These adjustments can lead to increased operational costs, including additional labour, training, quality and control measures.

Demonstrating ongoing compliance with regulations will require investment in Notified Body assessments of equipment, tests, and product recertification.

It is uncertain whether such efforts will ultimately provide a return on investment, especially with a high risk of failure during testing of any proposed replacement materials.

In addition to the product safety risks and manufacturer's liability, an EU ban potentially leads to unfair competition with non-EU manufacturers, and a significant impact upon exports from EU due to incremental cost increase.

Uncertain at this time, but there is a risk that manufacturers could opt to stop producing the products with the loss of jobs in the EU. The subsequent impact upon the mobility sector could be significant.


(Ricardo Jorge Gaspar Gomes)

CECOD - President

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