TECHNICAL PAPER

Specifying seals in the PFAS decision year:

What food and pharma engineers need to know now

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In 2020, our webinar 3 things to consider when choosing elastomers for food & pharma applications set out the fundamentals: The right certifications and approvals, the right chemical compatibility, and the right performance properties for the application. Five and a half years later, all three still hold true. But they no longer cover everything an engineer needs to consider.

When that webinar was recorded, the universal PFAS restriction didn't exist, even as a proposal. It was submitted to the European Chemicals Agency (ECHA) in January 2023, and by mid-2026 it's reached the final phase of scientific evaluation. A seal specified today for a filling line, a bioreactor or a CIP circuit could still be in service in 2033. Whether the material it is made from will still be readily manufacturable, purchasable and compliant at mid-life is now a legitimate engineering question.

We call it the fourth consideration: Regulatory survivability of the sealing material itself.

Where the PFAS restriction actually stands

Much of what was written about the proposed restriction between 2023 and 2025 is already out of date. Here is the position as of July 2026.

ECHA's Risk Assessment Committee (RAC) adopted its opinion on 2 March 2026. The Socio-Economic Analysis Committee (SEAC) published its draft opinion later that month, and the final 60-day consultation on it closed on 25 May 2026. ECHA is expected to deliver its consolidated opinion to the European Commission by the end of 2026, after which the Commission and member states decide the final form of the restriction. If the current trajectory holds, restrictions could begin to apply from around 2029.

Two details in the committee opinions matter more to seal specifiers than the headline dates. First, the draft opinions propose removing or narrowing a number of the derogations the industry had been counting on - so the assumption that fluoropolymers will simply be exempted is no longer safe. Second, even where fluoropolymer use survives, the proposal could bring obligations that didn't exist before: Site-specific PFAS management plans, emissions monitoring, labelling, and communication of PFAS content down the supply chain. Those obligations would not stop at the polymer plant. They flow down to anyone specifying and documenting sealing materials in a regulated process.

It's worth being precise about what the science says, because PFAS covers roughly 10,000 substances and they are not all alike. Most fluoropolymers used in sealing, including FKM, FEPM and FFKM, meet the OECD criteria for polymers of low concern: they are non-toxic, not bioavailable, non-water-soluble and non-mobile. The environmental problem sits largely in how some of them have historically been made, specifically the fluorinated surfactants used in polymer synthesis. That distinction matters when deciding what to do next, and it is exactly where responsible manufacturers are acting first.

The pressures arriving before any law does

Regulation is only half the story. Three market forces are already changing the calculation for anyone specifying seals in food, dairy or pharma production.

- **Feedstock supply.** Raw fluoropolymer supply has tightened as parts of the chemical industry withdraw from PFAS chemistry, and prices have moved accordingly. Engineers feel this today, years before any restriction takes effect.
- **Substitution momentum.** The EU launched Innovation and Substitution Hubs in March 2026 to accelerate the development of PFAS alternatives. The window in which 'no alternative exists' holds as an argument, and as a derogation justification, may close faster than many industries assume.
- **Diverging food-contact rules.** EU, US federal, US state and Chinese requirements for food-contact materials are drifting apart, particularly on PFAS. For global OEMs, 'compliant everywhere' is becoming genuinely hard to claim without a supplier who documents compliance market by market.

What this means when you specify a seal

A seal specified this year will live through the entire decision period. Three scenarios are realistic: The restriction lands broadly as drafted, it lands with narrowed derogations for fluoropolymers, or the timeline extends. The specification that survives all three is the one built on two tracks.

Track one - keep proven chemistry where performance is non-negotiable. Aggressive CIP and SIP regimes, potent APIs, high temperatures and aggressive process media are not places to experiment. Perfluoroelastomers such as Perlast® exist because nothing else survives those conditions, and the low-concern polymer profile of these materials is central to the case for their continued, derogated use.

Track two - qualify alternatives now, on your own schedule. Two kinds of alternative are worth qualifying before 2029 forces the issue. Fluorosurfactant-free versions of existing FKM grades keep the chemistry engineers already trust while removing the manufacturing process the regulation is most concerned with. And true non-fluorinated elastomers, such as EPDM and silicone grades with full food-contact approvals, already perform well in many food and dairy duties that don't need fluorinated chemistry at all. Qualification takes time - samples, testing, documentation, change control. Doing it in now is good planning. Waiting until 2028 is risky.

With budgets under pressure and supply tight, the temptation to trade down on seals is real. But an unproven low-cost seal that fails in a hygienic process does not just cost a replacement part. It costs unplanned downtime, investigation, and potentially a contamination event. Total cost of ownership arguments have never been easier to make than they are right now.

How PPE is supporting engineers through the transition

PPE's response to PFAS is a materials programme.

Under the PFAS Sustainability Program, PPE is transitioning its affected FKM grades to fluorosurfactant-free versions, known as NFS polymers, in line with the Fluoropolymers Product Group's voluntary commitment to cut non-polymeric PFAS emissions from fluoropolymer manufacturing. New material codes identify the NFS grades so there is no ambiguity about what has been specified: V91J, for example, becomes V91JF.

The transition is built around a principle engineers will fully appreciate: No compromise on

performance. Published comparisons between V91JF and the original V91J show close correlation across physical properties, compression set, thermo-analytical data and rapid gas decompression performance, along with equivalent behaviour in applicative testing on both O-rings and complex geometries. Sample parts, material information sheets and technical support are available now, so requalification can happen inside a planned maintenance and change-control cycle rather than a supply emergency.

Around the NFS transition sits a portfolio that covers both sides of the decision. Perlast® FFKM for the duties where fluorinated chemistry remains essential. Non-fluorinated food-contact elastomers where it doesn't. Detectaseal® metal-detectable and X-ray-detectable grades for contamination control. And across all of them, the compliance documentation that food and pharma audits actually demand: FDA 21 CFR 177.2600, EC 1935/2004 and EC 2023/2006, USP Class VI and 3-A Sanitary Standards, with batch traceability, so that new supply-chain communication requirements become paperwork PPE handles rather than a problem the customer inherits.

The part that matters most in a transition, though, is not the datasheet. It is having a real human expert to ask. PPE's application engineers and materials scientists work with customers from specification through the working life of the seal, in an in-house elastomer materials laboratory built for exactly the question every plant will be asking over the next three years: Can I substitute this material, in this application, without finding out the hard way? That question gets answered with testing and data - and a person you can turn to if you still need more.

What to look for in a sealing partner between now and 2029

Whoever you buy seals from, the next three years will test the relationship. Four things separate a partner from a parts supplier in this period.

- **Material development capability, not just compounding.** A supplier with its own materials lab can develop, test and validate a substitution. One that buys compounds in can only pass the question upstream.
- **A transition programme with parts you can order.** Roadmaps and statements are easy. Launched fluorosurfactant-free grades, published equivalence data and samples available for qualification are the difference between action and intention.
- **Engineering support before, during and after installation.** Requalification is where sealing problems surface. Support should not end at the point of sale.
- **Manufacturing resilience.** PPE manufactures in the UK and the US, which matters in a period when regional regulation and supply chains are pulling in different directions.

Specify for 2029, not 2023

The three fundamentals from 2020 have not changed: certifications, compatibility, performance. The fourth consideration is here to stay, and if the current regulatory trajectory holds, the decisions that determine who transitions smoothly will be made in the next eighteen months, not in 2029.

The first step is small: Review your sealing bill of materials and flag the seals that depend on affected grades. The next step is bigger, and it's

where your supplier matters. Qualifying fluorosurfactant-free equivalents means samples, equivalence data and testing - and questions along the way that a datasheet can't answer. That's work to do with an application engineer, not all by yourself.

Talk to a PPE application engineer about a PFAS-readiness review, or request NFS sample parts and begin qualification on your own schedule.

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