

ENGINEERING BULLETIN #175

PFAS Bans: Opportunity for Metal Hose?

Recent headlines and legislation at the federal and state levels are bringing “forever chemicals,” or perfluoroalkyl and polyfluoroalkyl substances (PFAS), well into the public eye. The immense, yet ambiguously defined, group of man-made chemicals face increasing scrutiny as their properties—namely an inability to break down naturally—become more widely known, fueling concerns about their impact on human health and the environment.

Higher rates of certain diseases, such as cancers, liver problems and thyroid issues, have been found in populations exposed to elevated PFAS levels. While government entities, like the Environmental Protection Agency (EPA), maintain current science suggests PFAS exposure “may lead to” adverse health outcomes, manufacturers of PFAS chemicals have paid out billions in settlements to plaintiffs since the early 2000s.¹

While tracking the impact of a single chemical among many variables over a significant period of time is challenging, the momentum of increasing regulation suggests there is more to come. As many companies work to research alternatives, input substitutes or remove product lines altogether, one wonders what the impact on the hose industry will be.

PFAS EXPLAINED

Developed in the 1940s, PFAS contain certain very strong carbon-fluorine bonds. The defining chemical bonds make PFAS near-indestructible and, at the same time, fantastically useful. PFAS resist oil, water, heat and grease, and products developed with them exhibit these same properties. Thanks to PFAS, rain jackets are waterproof, cooking pans are nonstick, and protective gear worn by firefighters withstands extreme temperatures.

These chemicals are used to make thousands of other products, from dental floss and diapers to semiconductors and smartphone batteries. In the flow control industry, PFAS are used in many applications.

¹ United States Environmental Protection Agency. *Our Current Understanding of the Human Health and Environmental Risks of PFAS*. Retrieved 20 August 2024 from <https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas>.

- Adhesives
- Gaskets
- Hoses
- Lubricants
- O-Rings
- Packaging
- Seals
- Tubing
- Wires

The number of chemicals under the PFAS umbrella varies greatly depending on which organization is consulted. The Organisation for Economic Co-operation and Development (OECD) lists 4,700 PFAS chemicals; the EPA identifies over 16,000.² The discrepancies contribute to the complex challenge of removing the well-embedded, though potentially harmful substances, from supply chains.

INCREASING LEGISLATION

Until somewhat recently, changes were made at the discretion of individual businesses and most attention focused on specific chemicals under the PFAS umbrella. PFOS and PFOA, “long-chain” varieties, were deemed more harmful and, in the early 2000s, the primary players in the PFAS industry agreed to voluntarily phase out production of the two chemicals.³

That changed in 2020 when the EPA laid out a framework for developing standardized testing methods and conducting further research on all PFAS with the aim of reducing upstream activities that release the chemicals, setting allowable limits, and supporting remediation efforts. Maine, Vermont and Oregon had previously adopted legislation restricting the use of PFAS in certain product categories, but 29 other states followed suit in the wake of the EPA’s announcement.⁴ Together the states have introduced and/or approved 271 new pieces of legislation banning PFAS since 2020.⁵

² Assent. *PFAS Compliance*. Retrieved 20 August 2024 from <https://www.assent.com/resources/pfas-compliance/>.

³ November 2017. United States Environmental Protection Agency. *Technical Fact Sheet– Perfluorooctane Sulfonate (PFOS) and Perfluorooctanic Acid (PFOA)*. Retrieved 29 August 2024 from https://19january2021snapshot.epa.gov/sites/static/files/2017-12/documents/ffrrofactsheet_contaminants_pfos_pfoa_11-20-17_508_0.pdf.

⁴ National Association of Hose and Accessory Distributors. *Status-State Legislation on PFAS*. Retrieved 20 August 2024 from https://nahad.org/wp-content/uploads/2024/01/PFAS-Status-Update_State-Legislation-01.2024.pdf.

⁵ National Association of Hose and Accessory Distributors. *Status-State Legislation on PFAS*. Retrieved 20 August 2024 from https://nahad.org/wp-content/uploads/2024/01/PFAS-Status-Update_State-Legislation-01.2024.pdf.

Action has not been confined to the state level. In April 2024, the federal government announced the introduction of the first nationwide, enforceable limit on five individual PFAS in drinking water based on the organization's findings.⁶

It is reasonable to assume that more legislation will follow. Later this year, the EPA's rule on reporting goes into effect, requiring any chemical manufacturer or importer of PFAS or PFAS-containing articles to submit information related to chemical classification, production volumes, industrial uses, commercial and consumer uses, worker exposure, disposal, and potential environmental and health effects.⁷ This includes companies in the industrial distribution space importing PFAS-containing products.

Assent, a management consultancy focused on supply chain, has already set up an entire practice to help clients assess vulnerabilities and develop an action plan for compliance. This is no easy feat. For instance, in the semiconductor industry, many processes at various stages of production depend upon the unique combination of surface tension, stability and chemical compatibility offered in PFAS-containing materials. A consortium of semiconductor manufacturers, with an active lobbying arm, maintain some PFAS-containing inputs are irreplaceable. Any attempts to do so would set advances in technology back decades.

INSURANCE AND PFAS: THE NEW ASBESTOS

As regulation, legislation and compelling voices from community groups elevate the conversation around these chemicals, insurance companies are moving to cover themselves. Some have likened the lawsuits, settled and pending, akin to those concerning asbestos that raged in the 1970s - 1990s.

When faced with a PFAS lawsuit, some insurance companies moved to sue the policy holder in an effort to excuse them from duty of coverage. In states that saw this scenario play out, Michigan, North Carolina and Texas ruled in favor of the policy holder, while New York ruled in favor of the insurance company. With such precedents in place, many carriers are including PFAS exclusions when renewing or writing new policies.⁸

⁶ April 10, 2024. The White House. *FACT SHEET: Biden-Harris Administration Takes Critical Action to Protect Communities from PFAS Pollution in Drinking Water*. Retrieved 20 August 2024 from <https://www.whitehouse.gov/briefing-room/statements-releases/2024/04/10/fact-sheet-biden-harris-administration-takes-critical-action-to-protect-communities-from-pfas-pollution-in-drinking-water/>.

⁷ United States Environmental Protection Agency. *TSCA Section 8(a)(7) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances*. Retrieved 29 August 2024 from <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/tsca-section-8a7-reporting-and-recordkeeping>.

⁸ Cally Edgren. April 25, 2023. Assent. *PFAS Lawsuits Signal New Chapter in Insurer Liability*. Retrieved 3 September 2024 from <https://www.assent.com/blog/pfas-lawsuits-signal-new-chapter-in-insurance-liability/>.

Without coverage, are companies producing or using products, components, and systems containing PFAS more vulnerable?

PFAS IN PIPING: PTFE

PTFE, often known by its brand name Teflon, is commonly found in the flow control industry. An alternative to rubber and metal, PTFE hoses exhibit some of those characteristics that make PFAS so fantastically useful. Like metal, though not to the same extent, PTFE produces corrosion resistant hoses that can operate in relatively high temperature and high pressure applications, making them one option for chemical transfer.

PTFE hoses also offer those same non-stick, water and grease repellent characteristics seen in other PFAS chemicals. Both “self-cleaning” and easy to clean, they are very common in the food and beverage, pharmaceutical and cosmetics industries.

IS PRODUCT OBSOLESCENCE ON THE HORIZON FOR PTFE HOSES?

While there is currently no regulation in the US banning PTFE hose, this may not always be the case as greater pressure is already being felt in Europe. In late 2023, The Netherlands, Germany, Denmark, Sweden and Norway submitted a proposal to the European Chemicals Agency (ECHA) to ban all PFAS, which would include banning PTFE hoses, gaskets, and the like.

There are industry voices seeking to block the ban, citing the criticalness of these chemicals which support a great number of jobs and contribute not insignificantly to economic output, but as previously seen, ongoing proposals and research will likely lead to some changes. Producers and end users may be well placed to proactively seek alternatives to current PFAS-containing processes and products.

AN ALTERNATIVE TO PTFE HOSE: METAL HOSE

When it comes to hoses, metal is a recyclable alternative to PTFE. In some applications, like [chlorine transfer](#), the debate between metal and PTFE has been ongoing for some time. In addition to concerns around impermeability, users may now question the “value” PTFE hoses offer in light of recent developments.

For users interested in considering other materials, metal also offers a wider range of chemical resistance than PTFE and can operate throughout a greater range of temperatures and working pressures.