PFAS Forever Chemicals Can Be Absorbed Through the Skin

Find out more about the PFAS chemicals and the risks of them being absorbed directly through the dermal layer of the skin.

AUSTIN, TX, UNITED STATES, September 11, 2024 / EINPresswire.com/ -- New Concerns that PFAS "Forever Chemicals" Could be Absorbed Through the Skin

The so-called "forever chemicals" – per- and polyfluoroalkyl substances (collectively known as PFAS) – have been in the news a lot this year, with the EPA instituting many new initiatives designed to protect the nation's drinking water from PFAS contamination:

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The first initiative is a new EPA drinking water standard, which went into effect in April 2024 and will limit certain PFAS chemicals in potable water. The EPA also proposed adding 6 additional PFAS chemicals to the drinking water standards. In concert with the new rules, the EPA announced it will fund $1 billion in new testing and treatment programs for public water systems and private wells, as part of the $2 billion allocated for environmental cleanup in the Bipartisan Infrastructure Law.

At the same time, the EPA officially designated two common PFAS chemicals – PFOA and PFOS – as hazardous substances under the Superfund Act, officially known as the Comprehensive Environmental Response, Compensation, and Liability Act (CERLA). This designation will help advance the cleanup of PFOA and PFOS contamination across the nation. In February 2024, the EPA also added nine PFAS chemicals to the Resource Conservation and Recovery Act (RCRA) list of chemicals of concern.

The EPA and General Services Administration also announced in April 2024 that federal

contractors and agencies will need to purchase/use cleaning products certified free of PFAS chemicals.

In June 2023, the EPA created rules requiring that any new uses of PFAS chemicals be reviewed before sales under the Toxic Substances Control Act (TSCA).
The EPA also established the largest-ever PFAS manufacturing inventory dataset in October 2023. This will affect all manufacturers and importers of PFAS-containing products made since 2011.

In January 2024, the EPA mandated that any release of one of seven different PFAS chemicals will need to be reported under the Toxics Release Inventory (TRI) report. Additionally, the EPA curtailed the production of 329 different PFAS chemicals that have not had a recent EPA review.

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While these new regulations and initiatives could go a long way to reduce human exposure to PFAS chemicals in drinking water, the story does not end there.

Unfortunately, laboratory scientists are finding that exposure to PFAS “forever chemicals” might be more extensive than first thought.

Researchers have identified several food products that show signs of high levels of PFAS contamination, and perhaps most worryingly of all, a recent scientific journal paper indicates that PFAS chemicals might be absorbed through direct contact with human skin.

The Discovery, Development, and Proliferation of PFAS Chemicals

Before we look at the latest dermal exposure research, let’s take a moment to recap the history of how PFAS chemicals were discovered and developed and why they have become such an integral part of modern life.

The first of the fluoropolymer chemicals, now known by the umbrella acronyms PFAS/PFOA, was discovered accidentally by Dr. Roy J. Plunkett in 1938 while he was researching new refrigerant

compounds at du Pont's laboratory in Deepwater, New Jersey.

During the preparation of 100 pounds of tetrafluoroethylene gas, Plunkett found a white powder had unexpectedly formed in the cylinder. The next day, they discovered the powder had turned into a waxy white solid material overnight.

Curious, Plunkett's lab investigated further and found the new substance was impervious to most chemicals, including highly corrosive acids.

The material, later identified as a long-chain polymer and given the name polytetrafluoroethylene (PTFE), had formed under high pressure – with the iron in the cylinder serving as a catalyst.

Shown above is a custom completion lab for an oil and gas customer that features a built-in fume hood and wet lab sinks.

PTFE found an important use during the Manhattan Project; it was used to seal pipes and valves containing highly reactive uranium hexafluoride produced in Oak Ridge, Tennessee's K-25 uranium enrichment plant.

The Proliferation of Polytetrafluoroethylene (PTFE) and other PFAS Chemicals in the Post-War Era

In the postwar period, PTFE was introduced to the market in 1948 under the brand name "Teflon." The first household non-stick pans, sold under the name "The Happy Pan," came to market in 1961.

Throughout the postwar period, lab researchers developed new variants of these fluoropolymer class chemicals, which found their way into a wide range of products, from waterproof fabrics (Gore-Tex) to stain-resistant upholstery, garments, and carpets (Scotchgard) to drip-resistant fast-food containers and wrappers, cleaning products, firefighters' fire suppression foam, dental floss, plumbing valves, and pipe joint sealing tape.

As useful as these new products were, there was a dangerous side as well.

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