UL Research Institutes | Chemical Insights

PFAS Basics

What are PFAS?

PFAS, or per- and polyfluoroalkyl substances, are a group of manmade chemicals used across many facets of our lives. Since the 1940s, PFAS have been commercialized and widely valued in product manufacturing. After their initial use in non-stick and protective coatings, PFAS use spread across many sectors. However, health concerns about specific PFAS (such as PFOS and PFOA) have prompted manufacturers to transition to other PFAS chemicals.

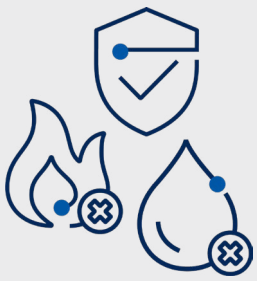
Today, there are more than 12,000 different PFAS with widespread usage and application across several industries. Common examples include fluorotelomer alcohol (FTOH), perfluorooctanoic acid (PFOA), and perfluorooctanesulfonic acid (PFOS).

The same properties that make PFAS so attractive for consumer and commercial use also contribute to potential exposure and human health risks. PFAS are made up of chains of carbon and fluorine atoms. The carbon–fluorine bond is arguably one of the strongest chemical bonds in nature. **This means that PFAS do not readily degrade in the environment or the human body and is why they have the nickname "forever chemicals."**

WHY ARE PFAS USED IN PRODUCTS?

PFAS give products unique properties like:

- **Thermal Stability** - The capacity to reduce flammability and heat gain.
- **Durability** - Resistance to impact and degradation.
- **Surfactant Ability** - The ability to repel water, sweat, grease, and stains.



© 2024 Underwriters Laboratories Inc.

What are the health risks associated with PFAS?

Data from the CDC show that approximately 97% of Americans have detectable levels of PFAS in their blood. Recently, the Environmental Working Group conducted a scientific review of 40 studies examining the presence and health effects of PFAS in cord blood—they found that all 40 had detected a wide range of PFAS in the blood. Yet, we do not fully understand how PFAS exposure occurs and what the potential health consequences are. Limited studies have linked PFAS exposure to:

- Altered fetal development
- Impaired cognitive ability in young children
- Negative effects on reproductive health
- Immune system disorders
- Prostate, kidney, and testicular cancers

HOW DOES PFAS EXPOSURE OCCUR?

People can be exposed to PFAS by using products containing them. This can occur by eating or drinking contaminated food or water, breathing contaminated air, and touching products or dust containing PFAS chemicals.

WHO IS MOST SENSITIVE TO PFAS EXPOSURE?

- Adults who are exposed to PFAS used in industrial and occupational settings
- Children who inhale more air, drink more water, and eat more food per pound of body weight than adults
- Infants and toddlers who are close to or crawl on the floor or who touch consumer products like toys and interior finish materials and then put their hands in their mouth
- Pregnant and lactating women who drink more water per pound of body weight than an average adult

PFAS in Performance Textiles

PFAS have been used for decades in a variety of consumer products, including wearable textiles, upholstery fabrics, and firefighter turnout gear. PFAS can potentially be released from these textiles, creating an exposure risk.

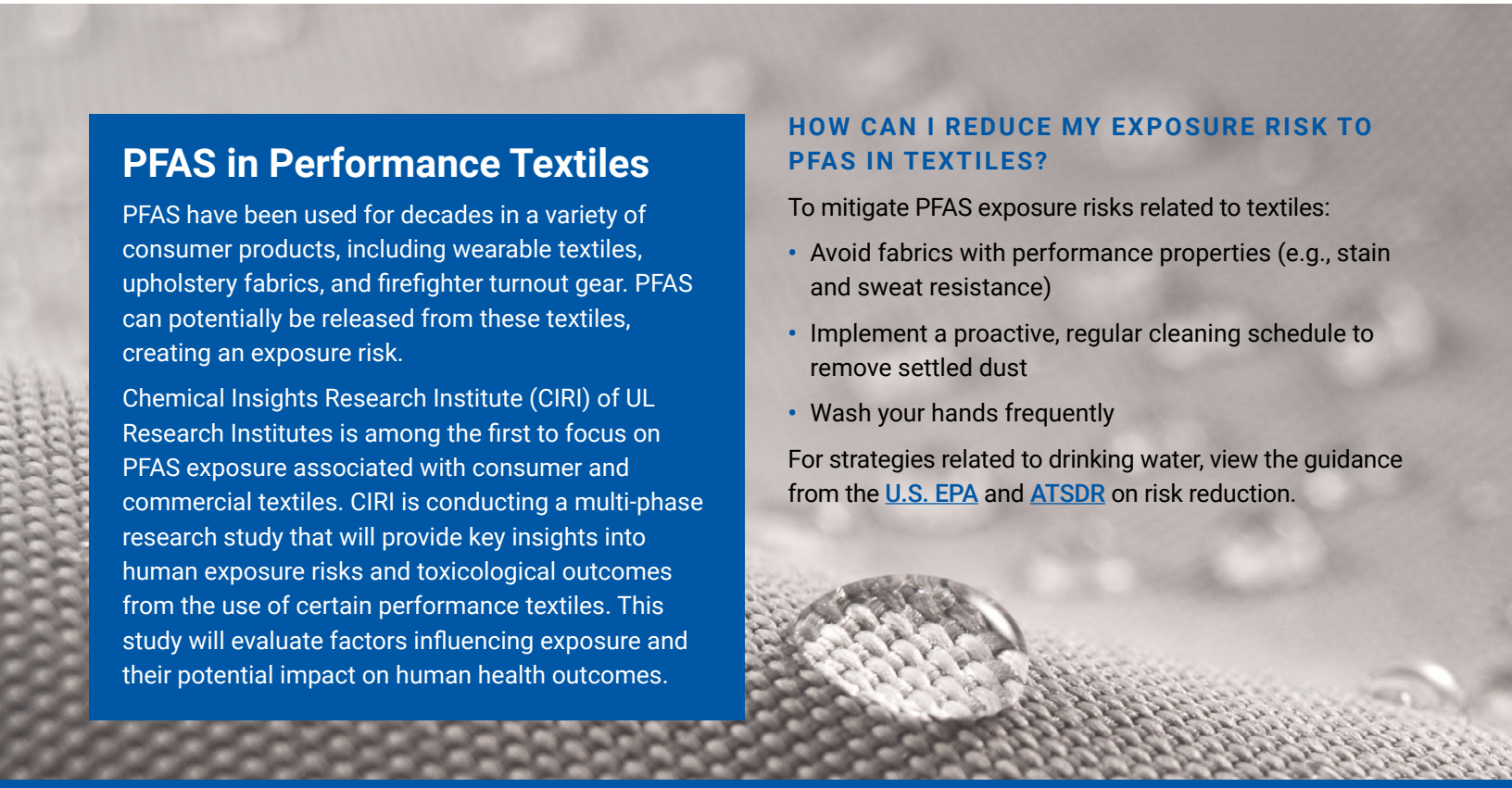
Chemical Insights Research Institute (CIRI) of UL Research Institutes is among the first to focus on PFAS exposure associated with consumer and commercial textiles. CIRI is conducting a multi-phase research study that will provide key insights into human exposure risks and toxicological outcomes from the use of certain performance textiles. This study will evaluate factors influencing exposure and their potential impact on human health outcomes.

HOW CAN I REDUCE MY EXPOSURE RISK TO PFAS IN TEXTILES?

To mitigate PFAS exposure risks related to textiles:

- Avoid fabrics with performance properties (e.g., stain and sweat resistance)
- Implement a proactive, regular cleaning schedule to remove settled dust
- Wash your hands frequently

For strategies related to drinking water, view the guidance from the U.S. EPA and ATSDR on risk reduction.



UL Research Institutes | Chemical Insights

Science for a safer, healthier tomorrow.

2211 Newmarket Parkway, Suite 106, Marietta, Georgia 30067 | chemicalinsights.org | chemicalinsights@ul.org

© 2024 Underwriters Laboratories Inc.