

PFAS and the Fire Service

What are PFAS?

PFAS, or per and polyfluoroalkyl substances, is a large family of manufactured chemicals that have been used in industry and consumer products worldwide since the 1950s.

PFAS do not occur naturally and are found in people, wildlife, and fish all over the world. PFAS are highly persistent and will stay in the body for a long time. PFAS do not breakdown easily in the environment, and are toxic to the environment, animals, and humans.

How can I be exposed to PFAS?

Fire fighters face an occupational exposure to PFAS through firefighting, training, and daily interactions with flame-suppressing foams (AFFF) and turnout gear.¹ Although some types of PFAS are no longer used, many products may still contain PFAS, including food packaging materials, nonstick cookware, stain-resistant carpet treatments, water-resistant clothing, cleaning products, paints, varnishes and sealants, some cosmetics, as well as AFFF firefighting foam and turnout gear.

How is my exposure measured?

Exposures are measured through blood serum levels. PFAS compounds penetrate the skin on both animals and humans.² Dermal exposure may result in local and systemic toxicity.

Recent studies show that increases in blood serum levels of PFOA can be measured around six hours post dermal exposure to PFOA (C8),¹ demonstrating that skin is likely a significant route of exposure.

How can PFAS affect your health?

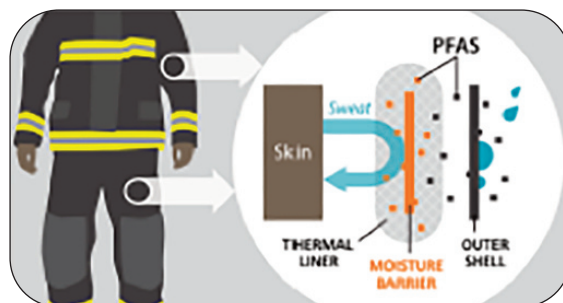
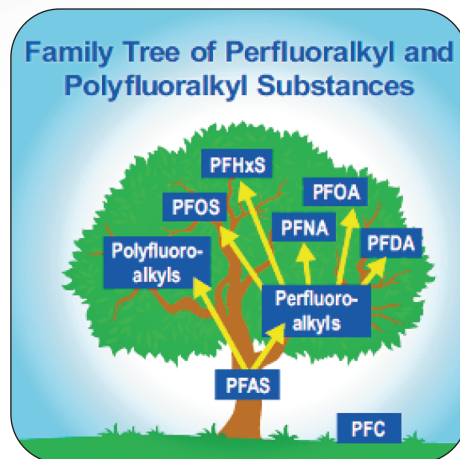
Scientists are still learning about the health effects of exposures to mixtures of PFAS. Scientific studies suggest that certain PFAS may affect different systems in the body. Human research studies suggest that high levels of certain PFAS may lead to increased cholesterol levels; changes in liver enzymes; decreased vaccine response in children; increased risk of high blood pressure or preeclampsia in pregnant women; small decreases in infant birth weights; and increased risk of kidney, non-Hodgkin lymphoma, ovarian, prostate, and testicular cancers.

How can I reduce my exposure to PFAS?

In addition to occupational exposures, PFAS are present at low levels in some food products and in the environment (air, water, soil, etc.). While you cannot prevent PFAS exposure altogether, you can take steps to reduce your risk of exposure and support additional research that looks into PFAS chemicals:

PFAS in Turnout Gear

- Turnout gear should NOT be taken into firehouse living areas.
- When transporting gear in personal vehicles, it should be in a sealed container or bag, and preferably NOT transported in the passenger compartment.
- Apparatus cabs should be cleaned regularly and after every fire.
- Wash your hands after handling turnout gear.



How can I reduce my exposure to PFAS? (continued from Page 1)

- Legacy turnout gear should be replaced as new PFAS-free technologies become available.
- Do not wear turnout gear on responses where this level of protection is not necessary.*

PFAS From the Fireground

- Limit use of PFAS-containing firefighting foams.
- Do not wear turnout gear for physical fitness.
- Where possible, wear gloves when handling PPE. If not, wash your hands after handling.
- When transporting in a car, put PPE in a bag or container.
- When cleaning apparatus, PPE locker room, or app bays – DO NOT use an air hose or leaf blower.
- Use a shop vacuum with a HEPA filter to vacuum the floor or wet mop to limit the exposure to dust that is shed from PPE.
- Use a damp towel to wipe down other surfaces in apparatus.
- Dispose of PFAS-containing gear and AFFF appropriately to limit further environmental contamination.
- Shower within the hour after every exposure to occupational exposures.

Other Exposures

- If your drinking water contains PFAS above the EPA Lifetime Health Advisory (0.004 parts per trillion [ppt] for PFOA, 0.02 ppt for PFOS, 10 ppt for GenX chemicals, and 2,000 ppt for PFBS), consider using an alternative or treated water source.
- Read consumer product labels and avoid using those with PFAS.
- Limit personal exposure to PFAS from consumer products.

*Wearing all PPE and SCBA during firefighting, overhaul, and while working in smoke is still the best first line of defense when it comes to limiting exposures to fireground contaminants. Following any exposure to the products of combustion, all PPE should be cleaned in accordance with NFPA 1851 to reduce cross-contamination and further exposure.

Where can I find more information on PFAS?

The IAFF and the Metropolitan Fire Chiefs Association (Metro Chiefs) issued a joint safety advisory on the adverse health risks from PFAS in fire fighter turnout gear. Learn more here: iaff.org/PFAS.

Sources:

1. Graham F. Peaslee, John T. Wilkinson, Sean R. McGuinness, Meghanne Tighe, Nicholas Caterisano, Seryeong Lee, Alec Gonzales, Matthew Roddy, Simon Mills, and Krystle Mitchell Environmental Science & Technology Letters 2020(8), 594-599 DOI: 10.1021/acs.estlett.0c00410.
2. Franko J, Meade BJ, Frasch H, Barbero A, Anderson SE [2012]. Dermal Penetration Potential of Perfluorooctanoic Acid (PFOA) in Human and Mouse Skin. J Toxicol Environ Health 75(1):50-62.
3. Jennifer Franko, B. J. Meade, H. Frederick Frasch, Ana M. Barbero & Stacey E. Anderson (2012) Dermal Penetration Potential of Perfluorooctanoic Acid (PFOA) in Human and Mouse Skin, Journal of Toxicology and Environmental Health, Part A, 75:1, 50-62, DOI:10.1080/15287394.2011.615108.

