

# WHAT ARE PFAS?



PFAS (per- and poly-fluoroalkyl substances) are a man-made class of thousands of 'forever chemicals' that do not break down in the environment, are highly mobile, and can accumulate in the body and cause disease. Firefighters are a particularly vulnerable population to these chemicals due to their levels of occupational exposure. There are many potential exposure pathways for these chemicals and associated health impacts, all of which will be outlined in the coming sections.



## 01 — Human-Made, Largely Unregulated Group of Chemicals

According to the EPA Comptox data-base, there are over 12,000 different types of PFAS chemicals and 98% of people have PFAS in their blood (EPA). These 'forever chemicals' have been around for nearly 70 years and have yet to be adequately monitored and regulated. Some large companies knew of their toxicity early in production, but did not disclose that information. A small number of commonly used PFAS were phased out but many others are in use. Those currently in use have not been shown to be safe, an unfortunately common occurrence that reflects deficiencies in our federal chemical policy legislation & enforcement.



## 02 — Ubiquitous in Consumer Goods

PFAS have been used to make non-stick, grease resistant, stain resistant, flame retardant, water-proofing materials. They have been incorporated into hundreds of consumer markets, as outlined in the 'Exposure' section of this packet. Notably, high levels of PFAS have been found in firefighting gear, consumer products, food sources, and contaminated drinking water.



## 03 — Health Impacts

Suppressed immune function, lower vaccine efficacy, thyroid disease, testicular and kidney cancers, elevated cholesterol, liver effects, impaired fertility, and ulcerative colitis are all potential health effects that have been associated with elevated levels of PFAS in the body. These chemicals contribute to a wide array of health conditions, requiring additional health monitoring, particularly for vulnerable or occupationally exposed demographics.



## 04 — Lack of Regulation

PFAS production, use, and levels in drinking water are not federally regulated. Only a handful of states have passed regulatory standards for PFAS in drinking water, but most PFAS remain unregulated and will continue to be unless a class-based and essential use regulatory approach is adopted. PFAS are also not regulated in workplaces or as hazardous waste, which allows for continued exposures and discharges into the environment.



# FIREFIGHTER PFAS EXPOSURES



PFAS are widely used in consumer goods, pesticides, artificial turf, firefighting foam & gear, and countless other industries. PFAS are highly persistent, making them long-lasting and accumulative.



## 01 — Class B Aqueous Film-Forming Foam (AFFF)

Class B Aqueous Film-Forming Foam or AFFF is used in the fire service to fight fuel fires and contains a mixture of many different PFAS chemicals. Many departments have trained with and/or used this type of foam. Users are exposed when spraying it or upon contact, especially if not wearing SCBA, proper gear, or gloves. This class of foam is largely linked to PFAS contaminated drinking water sources when applied and improperly cleaned up.



## 02 — Turnout Gear

Turnout gear textiles are manufactured with a multitude of PFAS to provide water and oil repellency. As this gear heats up, more and more of these chemicals are shed from the gear. Some gear manufacturers make PFAS-free outer shells, but PFAS remain in the moisture barrier. It is always a healthy practice to wash your hands after handling gear, store gear away from living spaces, and wash your gear after a fire.



## 03 — Fire Station Dust

According to a 2021 Harvard study, fire station dust particulates contain PFAS and were found in all areas of the study's station - kitchen, bunks, garages, etc. - with the highest median concentrations being found in turnout gear locker rooms.



## 04 — Building Fires

PFAS are used in many building materials and furnishings to impart stain- and water-resistance and are released when those products burn. Wearing SCBA, turnout gear, and gloves can help protect workers from PFAS and other harmful chemicals (PAHs, flame retardants, dioxins, etc.) released or created in fires.



## 05 — Contaminated Food & Water

Food sources, food packaging, and drinking water are further potential PFAS exposure pathways and are all considered concerning given that they are directly ingested. PFAS move easily in the environment and can contaminate surface & groundwater, leading to potential contamination of fish, wildlife, & livestock food sources. Much water- and grease-resistant food packaging i.e. fast food wrappers, parchment paper, takeaway containers, & microwave popcorn bags contain PFAS. It is estimated that 200 million Americans are drinking PFAS contaminated water. Consider testing your private well & reducing dietary intake of food hunted or fished for if you live in an area where contamination has been found or is likely to have occurred.



## 06 — Consumer Goods

There are currently innumerable consumer product industries that include PFAS in their products, use PFAS in the making of their product, or unintentionally add PFAS to their products in production. Products that may use PFAS in any of these three ways include textiles, furniture & upholstery, carpeting, paints, pots & pans, artificial turf, cosmetics, sunscreens, guitar strings, dental floss, and many others.



# REDUCE YOUR EXPOSURE TO PFAS IN TURNOUT GEAR



PFAS exposures in firefighting are linked to Class B aqueous film-forming foam (AFFF), firefighter turnout gear, and fire station dust. Your turnout gear protects you from burns and harmful chemicals during a fire, so it is essential protective equipment. It also can contain residual chemicals from a fire even after washing and may continuously shed PFAS. Below are guidelines for reducing your exposure to PFAS from turnout gear.



## 01 — Only Wear Turnout Gear When Essential

Reconsider wearing your turnout gear on calls where there is NOT a fire. Only wearing your turnout gear when absolutely essential will help to reduce your PFAS exposure by limiting your contact.



## 02 — Store Turnout Gear in an Enclosed, Designated Area

Gear should be stored in an enclosed, designated area that is away from living/eating areas. Ideally, this area has its own air filtration/HVAC system. This will reduce your contact with any PFAS released from the gear into air and dust, as well as other carcinogens that get onto gear during a fire. If your station does not have separate storage capabilities, then store gear in closed lockers or gear bags when not in use.



## 03 — Thoroughly Clean Contaminated Turnout Gear

Clean is the new salty! Thoroughly clean any contaminated turnout gear, including hood, gloves, boots, SCBA mask, and helmet. Keep your gear clean to protect your health. Ideally, fire stations should work towards having an extractor to wash turnout gear and a designated hazard area for drying so firefighters are neither washing nor drying gear at home.



## 04 — Use Hazard Zones Designations at the Station

The IAFF recommends having three hazard zones - red, yellow, & green - in the station to avoid contamination from toxic chemicals. Red Zones are where decontamination of contaminated gear/equipment occurs. Yellow Zones are for clean gear/equipment storage. Green Zones are living spaces where gear/equipment are not allowed.



## 05 — Wash Hands

Wash your hands with soap and water to remove PFAS and other contaminants after handling your turnout gear, especially before eating or preparing food.



## 06 — Advocate for Fluorine-free Alternatives

Speak to your station, union, town, and legislators as needed for support in obtaining fluorine-free turnout gear. Getting PFAS out of products in the fire service will help protect firefighters and their communities.



# PFAS AND YOUR HEALTH



PFAS are associated with several serious health risks. Firefighters are at risk of having elevated PFAS levels and can take action to learn more about their exposure and protect their health.



## PFAS Health Effects

- Immune Suppression (USEPA)
- Kidney Cancer (ATSDR)
- Impaired Fertility (USEPA)
- High Cholesterol (ATSDR)
- Liver Effects (ATSDR)
- Testicular Cancer (ATSDR)
- Hormone Disruption (USEPA)

See the 'Exposure' section of this packet to gain a better understanding of your occupational exposure pathways - turnout gear, firefighting foams, and even fire station dust.



## PFAS Blood Testing

There are specific tests that you can request from your doctor to measure the level of PFAS in your blood.

Providers should use ICD-10 diagnosis code Z13.88, and if ordering a test through Quest, they should use Test Code 39307 and CPT Code 82542.



## PFAS Medical Screening

Many of the medical screening recommendations for PFAS are part of your regular physical like monitoring for cholesterol and checking for testicular cancer. Your doctor may also consider including other basic tests recommended in current medical screening guidance for PFAS.

More guidance on PFAS blood testing and clinician resources are available online at [www.pfas-exchange.org/resources](http://www.pfas-exchange.org/resources).

