



PFOA FAQ for the Fire Service

Release Date: 10/24/2018

Understanding Perfluoroalkyl Substances (PFAs) and PPE

There is no doubt that a heightened awareness exists for firefighter exposure to different carcinogens given the rising rates of cancer among the fire service and specific evidence that shows that firefighters at elevated risks for specific cancers, often at younger ages, as compared to the general population. It is also well-established that the smoke and other contaminants from the fireground and other emergency activities create a myriad of different, persistent exposure hazards to firefighters. Therefore, it is understood how information on certain hazardous substances in personal protective equipment (PPE) itself could lead to further concerns related to additional forms of exposure. Of specific note is the class of chemicals known as perfluoroalkyl substances, commonly abbreviated PFAs, which have received a great deal of recent attention both by the public and within the fire service.

What are PFAs?

PFAs are special class of organic chemicals that generally entail having multiple fluorine atoms as part of their carbon-chain molecular structures. There are hundreds, if not thousands of different PFA chemicals. General information on PFAs can be found from the following two U.S. government websites:

<https://www.epa.gov/pfas/basic-information-pfas>

<https://www.atsdr.cdc.gov/pfas/>

How Do PFOA and PFOS related to PFAs?

Certain PFAs are known to be extremely hazardous either as potential carcinogens or toxins. Two examples of the most studied PFAs that have been characterized in this way include Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS). These chemicals have also been referred to as "C8" given their 8-carbon organic structure primarily populated with fluorine atoms. Both chemicals are surfactants that have been historically used in several industrial applications related to creating water or stain-repellent finishes on different types of products including certain textiles. In fact, these chemicals have been used on a large array of different consumer products including carpet, upholstery, floor waxes, some forms of cookware, food wrappers, and even in trace amounts as part of microwave popcorn bags. However, as information became available on their specific toxicity and persistency in the environment (meaning the chemicals do not break down easily), the U.S. Environmental Protection Agency asked companies to voluntarily phase out the use of these chemicals beginning in 2005 with 100% discontinuation of their use in 2015.

What is the Relationship of PFOA and PFOS to Firefighting?

In terms of PPE and firefighting, PFOA and PFOS had been associated with transfer agents for the water-repellent finishing process on fabrics used in turnout clothing many years ago, but as increasing health concerns became apparent for these chemicals, the industry switched to different repellent treatments, though some of which are still considered to be in the general class of PFAs, but are not known to pose specific toxic or carcinogenic hazards. Specific concerns for the use of PFOA and PFOS have also arisen for their use in different Class B firefighting foams



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that are commonly applied during fire suppression to prevent reignition of fuel materials. It is also important to point out that PFOA and PFOS can also occur as contaminants in various types of fires where products containing these chemicals are burned releasing the chemicals to deposit on different surfaces including firefighter ensemble equipment.

Are PFAs, PFOA, and PFOS Regulated in the Fire Service?

As a result of the emerging concerns, the State of Washington enacted new state regulations in July 2018 banning the use of Class B firefighting foams that contain PFAs, with certain exceptions, and further required manufacturers of PPE which contain any PFAs (beyond just PFOA and PFOS) to disclose that information to the departments who purchase the PPE and to indicate the reasons for why PFAs are used in the product. In November 2017, PFOA and PFOS were added to the list of chemicals in Proposition 65 for the State of California. Proposition 65 requires that manufacturers that sell products containing Proposition 65 listed chemicals, now including PFOA and PFOS, to provide a clear and reasonable warning that the product includes those chemicals. In addition, many states are establishing further regulations related to PFOA, PFOS, and one additional specific PFA – Perfluorononanoic acid (PFNA) primarily as related to action levels for these substances in drinking water.

Are There Hazards for Using Firefighter PPE with PFAs, PFOA, or PFOS?

No one has a clear answer for this question. Specific health concerns have been linked to certain PFAs, namely PFOA and PFOS. The fire service industry has eliminated the use of PFOA and PFOS in the transfer agents of water repellents added to textile finishes for PPE. This means that newer clothing manufactured over the last several years has not contained these chemicals, though it is possible that clothing could be contaminated with PFOA, PFOS, or other PFAs from regular fireground and other types of operational exposures. Where legacy clothing was manufactured before the industry transitioned away from PFOA and PFOS, it is unknown how much of these chemicals remain in the PPE, if they will be released, and if so, what exposures they may create. Yet, studies do show that the repellent properties of clothing often are reduced with continued use and laundering. This information suggests that these chemical additives may have leached out of the clothing at relatively low rates over a long time. Even if PFOA or PFOS is found in or on clothing, it is not known at what levels these chemicals can create exposure hazards. One of the principal routes of exposure is through ingestion of contaminated water or food. There is some scientific research that suggests that PFOA can permeate skin where dermal absorption can be a route of entry under certain conditions. However, there is no research that links specific exposures of firefighters using PPE with PFA-based chemicals to their accumulation within their bodies. Moreover, it would be difficult to isolate PPE as the source of PFOA or PFOS since the general population already has potential exposure to these substances in small amounts from everyday non-PPE products and the general environment.

What is the Most Responsible Path Forward?

PFAs, including PFOA and PFOS, are one among many different types of contaminants to which firefighters may be exposed. Certainly, while specific research studies are needed to quantify exactly how much of these chemicals are in different PPE and more importantly if they can be released under expected use conditions and create hazards to the firefighter, the best current approach is to adopt the comprehensive contamination control practices now being promoted



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throughout the fire service. These practices dictate full use of PPE including respiratory protection during all stages of a fire event (including overhaul), undergoing preliminary exposure reduction at the fire scene with a water and soap rinse before removing PPE, separately bagging and isolating contaminated PPE, subjecting PPE to advanced cleaning as soon as practically possible following its use on the fireground, and for firefighters to exercise strict personal hygiene by washing their hands at the fire scene and taking a shower followed by putting on clean clothing following any working fire.

About the Verified Independent Service Provider Association (VISPA)

This FAQ was developed by VISPA and an industry expert in response to concerns raised by fire departments regarding potential exposure. VISPA is hopeful that we have taken some of the confusion out of this important issue. VISPA is a leading provider of education on the proper care and maintenance of Personal Protective Equipment (PPE) including Structural Turnout equipment used in the Fire Service. VISPA membership includes companies serving major metropolitan fire departments and volunteer fire departments in North America. Go to www.vispinc.org.

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