

This fact sheet has been prepared by the technical staff of No-Pollution Enterprises. It is intended to keep our visitors informed of PFAS.

PFASs comprise a large group of chemicals that are both chemically and thermally stable and are both lipophobic (have no affinity for oils) and hydrophobic (have no affinity for water). The most investigated classes of PFASs are the perfluorocarboxylate acids (PFCAs) and perfluoroalkyl sulfonic acids (PFASAs). The most studied PFAS are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). These chemicals are known to cause health problems. Please refer to other Facts Sheets for relevant information on these chemicals.

## AQUEOUS FIRE FIGHTING FOAMS

'AFFF' refers to aqueous firefighting foam. There are different types of firefighting foams that are used for containing and controlling Class B fires.

Class A firefighting foams do not contain fluorochemicals.

Products that are capable of aqueous film-formation for Class B fires – i.e., AFFF-type foams – all contain fluorosurfactants, which may be either perfluorinated or polyfluorinated materials.

Class B fire foam products include:

- Protein Foam,
- Fluoroprotein Foam FP,
- Film Forming Fluoroprotein Foam FFFP,
- Alcohol-Resistant Film Forming Fluoroprotein Foam AR-FFFP,
- Aqueous Film Forming Foam AFFF,
- Alcohol-Resistant Aqueous Film Forming Foam AR-AFFF, and
- Synthetic Detergent Foam.

PFOS has historically found a strong market in film foam firefighting formulations. In 1966 AFFF became the preferred method for extinguishing liquid hydrocarbon fires. By 1969, the market application was well underway as the Department of Defense (DOD) issued military specification Mil-F-24385, which includes the requirements for AFFF liquid concentrate fire extinguishing agents consisting of PFOS. AFFFs capable of meeting the MIL-F-24385 specifications were developed by seven manufacturers since the 1960s; these include:

- 3M,
- Ansul,
- National Foam,
- Angus,
- Chemguard,
- Buckeye, and
- Fire Service Plus, Inc.

These companies developed AFFF products for the use in extinguishing fires at military bases, airports, oil refineries, and firefighting training facilities throughout the U.S. and also sold their products worldwide.



In 2000, the 3M Company (the largest AFFF supplier in the world) announced that production of PFOS-based fluorosurfactants was being phased out. While manufacturing has ended in the United States, facilities are allowed to continue using PFOS-based AFFFs until stockpiles are depleted. EPA issued Significant New Use Rules (SNURs) under its Toxic Substances Control Act (TSCA) authority to restrict the production and use of products that contain PFOS and its precursors; however, EPA, the Federal Aviation Authority, and other regulatory agencies continue to allow its use.

Environmental impacts from the use of AFFF may largely be attributed to legacy use. Existing stocks of PFOS-based foams continue to be used and, additionally, may be present in fixed firefighting systems. The disposal of firefighting foams is primarily to sewers which wind up contaminating wastewater treatment plants, to storm water drains, as well as uncontrolled releases to surface waters or open land during firefighting. Containment and confinement depends on the manner in which the foam is used and the fire location.

