



# Per- and Polyfluorinated Substances (PFAS) Factsheet

The per- and polyfluoroalkyl substances (PFAS) are a group of chemicals used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. Fluoropolymer coatings can be in a variety of products. These include clothing, furniture, adhesives, food packaging, heat-resistant non-stick cooking surfaces, and the insulation of electrical wire. Many PFAS, including perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), are a concern because they:

- do not break down in the environment,
- can move through soils and contaminate drinking water sources,
- build up (bioaccumulate) in fish and wildlife.

PFAS are found in rivers and lakes and in many types of animals on land and in the water.

## PFAS Exposure in People

PFAS persist in the environment and exposure in people can occur by consuming PFAS-contaminated water or food. Exposure may happen by using products that contain PFAS.

## How PFAS Affect People's Health

Human health effects from exposure to low environmental levels of PFAS are uncertain. Studies of laboratory animals given large amounts of PFAS indicate that some PFAS may affect growth and development. In addition, these animal studies indicate PFAS may affect reproduction, thyroid function, the immune system, and injure the liver. Epidemiologic studies on PFAS exposure evaluated several health effects. Descriptions of these studies are available at: <https://www.atsdr.cdc.gov/pfas/>. More research is necessary to assess the human health effects of exposure to PFAS.

## Levels of PFAS in the U.S. Population

Since 1999, CDC scientists have measured at least 12 PFAS in blood serum (the clear portion of blood). Blood serum is obtained from participants, aged 12 years and older, who have taken part in the National Health and Nutrition Examination Survey (NHANES) (Fourth National Report on Human Exposure to Environmental Chemicals, Updated Tables). By measuring PFAS in serum, scientists can estimate the amount of PFAS in people's bodies.

CDC scientists found four PFAS (PFOS, PFOA, PFHxS or perfluorohexane sulfonic acid, and PFNA or perfluorononanoic acid) in the serum of nearly all of the people tested. This indicates widespread exposure to these PFAS in the U.S. population. The data tables showing results since 1999 are available here: <https://www.cdc.gov/exposurereport/>.

Finding a measurable amount of PFAS in serum does not imply that the levels of PFAS cause an adverse health effect. Biomonitoring studies on levels of PFAS provide physicians and public health officials with reference values. These reference values can determine whether people have been exposed to higher levels of PFAS than the general population. Biomonitoring data also help scientists plan and conduct research on exposure and health effects.

## Additional Resources

### Agency for Toxic Substances and Disease Registry

- [Toxicological Profile for Perfluoroalkyls](#)

- [Information about Per- and Polyfluoroalkyl Substances and Your Health](#)

## Environmental Protection Agency

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

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