



**Bureau of
Environmental Health
Health Assessment Section**

"To protect and improve the health of all Ohioans"

C8

C8 is also known as Perfluorooctanoic acid and/or PFOA

What is C8 (Perfluorooctanoic acid)?

C8, otherwise known as perfluorooctanoic acid and/or PFOA, belongs to a manmade group of chemicals called perfluorochemicals (PFCs). C8 is a chemical that resists heat, water, oil, grease and stains. C8 is used during the process of making common household and industrial items such as nonstick pots and pans (e.g. Teflon[®]), flame-resistant and waterproof clothing (Gore-Tex[®]), wire coatings and chemical-resistant tubing. C8 can also be formed by the breakdown of certain other highly fluorinated chemicals used in stain-resistant carpets and fabrics (e.g., Stainmaster[®]), stain-resistant paints, fire fighting foam, and oil and grease-resistant coatings on fast-food cartons/containers and wrappers.

Note: Teflon[®] and other trademarked products are NOT C8/PFOA. C8 is used to make some Teflon[®] and other non-stick, non-stain coated products.



How does C8 get in the environment?

C8 can be released into the environment when facilities and people use products that contain this chemical.

C8 is chemically stable, meaning it is slow to break down and can stay in the environment a long time. C8 can be transported long distances in the air and water. Because this chemical moves easily and is slow to breakdown (degrade), C8 and other PFCs are widespread in the environment.

A Michigan State University study found PFCs in the blood of 400 different mammals, fish and birds on all seven continents. Studies show that nearly all people, regardless of age, have some C8 in their blood.

Visit the U.S. EPA website to learn about their actions taken to investigate the health effects of C8 related chemicals as well as to reduce their emissions and use in products. US EPA site: <http://www.epa.gov/oppt/pfoa/>

Does C8 harm human health?

The U.S. EPA has classified C8 as "likely to be carcinogenic (cancer causing) to humans."

Animal studies have shown that C8 can harm the liver and reproductive and developmental problems have been seen in the offspring of mice exposed to C8 while pregnant.

Several human studies have shown that C8 and other PFC compounds can interfere with the body's ability to breakdown some fats and oils. Epidemiological studies (i.e., population based human studies) suggest that exposure to C8 may be associated with increased cholesterol levels, increased risk of diabetes and an increased risk of heart disease. Human exposure to C8 has also been associated with effects of the reproductive and immune systems.

Note that associations between an exposure and a health outcome (or disease) do not mean that the exposure caused the adverse health effect. Epidemiological studies cannot account for all factors that play a role in the association. And although the scientific literature of evaluating the effects of C8 and PFCs is growing, there is still a lot that is unknown.

C8 in the blood of Ohio Valley residents and the general population:

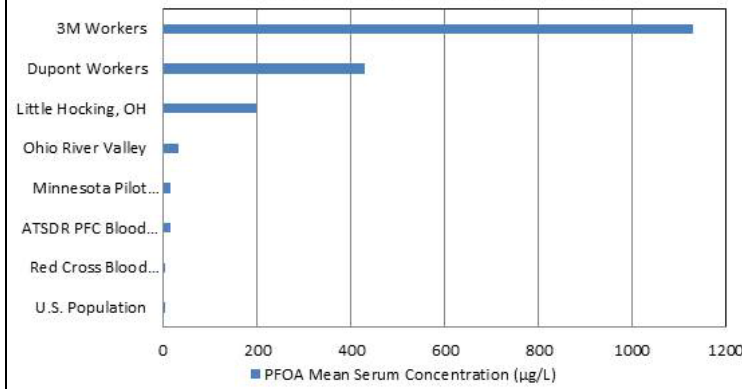
Since the 1950's, the DuPont Washington Works facility in Lubeck, Wood County, West Virginia used C8 (PFOA) in its fluoropolymer manufacturing processes. Releases from the DuPont Washington Works facility led to the widespread contamination of Ohio River surface waters and the contamination of six public water districts and many private groundwater wells in Washington County, Ohio and in Wood County and Mason County, West Virginia.

Scientists from the Centers for Disease Control (CDC) have measured 12 PFCs in the blood serum of thousands of participants aged 12 years and older who have taken part in the National Health and Nutrition Examination Survey (NHANES). C8 and other PFCs have been detected in the blood serum (the clear portion of blood) in nearly all of the people tested. (see the *PFOA Studies: Comparison of Average Blood Levels* graph at the top of next page)

However, it appears that human blood concentrations of PFOS and C8 in the US population are dropping. The average levels of C8 in human blood dropped from 5.21 µg/L (from the 1999-2000 Survey) to 3.07 µg/L (2009-2010 Survey.)

Note: µg/L = microgram per Liter or a part per billion (ppb)

PFOA Studies: Comparison of Average Blood Levels



Class Action Lawsuit – C8 Health Project

Leach, et al. v. E.I. DuPont de Nemours & Company

In August, 2001, attorneys filed a class action lawsuit in the Wood County Circuit Court against DuPont on behalf of West Virginia and Ohio residents exposed to C8 through their drinking water supplies.



The “class” in this suit included all persons drinking water for at least one year before December 3, 2004 supplied by: 1) the Little Hocking Water Association (OH); 2) the City of Belpre water supply (OH); 3) the Tupper Plains-Chester Water District (OH); 4) the Village of Pomeroy (OH) water system; 5) Lubeck Public Service District (WV); 6) the Mason County Public Service District (WV); and 7) private water supplies within this area found to be contaminated with C8.

C8 Health Project: Brookmar, Inc

As part of the C8 Health Project class action lawsuit settlement, the Wood County WV Circuit Court ordered the collection of health data to be used in a study to determine whether C8 can be linked to human disease in the area impacted by the DuPont Washington Works releases. Brookmar, Inc., a local Parkersburg, West Virginia company, was appointed by the Court to collect this data from the “class.”

In June of 2006, over 70,000 participants completed a health questionnaire and over 64,200 persons had had their blood drawn for analysis.

For more information on the C8 Health Project, visit:
<http://publichealth.hsc.wvu.edu/c8/>

C8 Health Project: Science Panel

The collected health histories and blood test results were submitted to an independent Science Panel, comprised of three internationally-recognized epidemiologists.

The collected health histories and results of the blood were analyzed by the Science Panel to determine if there is a link between elevated C8 levels in blood and incidence of specific diseases in the exposed population.

For more information on the Science Panel, visit:
<http://www.c8sciencepanel.org/panel.html>

C8 Science Panel Findings

In November 2012, the C8 Science Panel completed its primary task, evaluating whether or not there is a "Probable Link" between exposure to C8 and a range of diseases among people living in the Mid-Ohio Valley.

In a series of five reports the panel noted a “Probable Link” between exposure to C8 and pregnancy-induced hypertension, thyroid disease, ulcerative colitis, testicular cancer, kidney cancer and high cholesterol. Make note the reports found no link between C8 and other types of cancer reviewed in the study.

“No Probable Link” was noted between exposure to C8 and birth defects, miscarriage or stillbirth, and preterm birth or low birth weight. They also did not find a link between Type II diabetes, stroke, asthma or chronic obstructive airways disease (COPD), neurodevelopmental disorders in children (such as attention deficit disorders and learning disabilities), common infections or autoimmune disorders other than ulcerative colitis (to include rheumatoid arthritis, lupus, Type I diabetes, Crohn’s disease or multiple sclerosis), Parkinson’s disease, osteoarthritis, liver disease, chronic kidney disease, hypertension or coronary artery disease.

The full Science Panel reports can be found on-line at:
http://www.c8sciencepanel.org/study_results.html

An ODH quick-glance summary of the Science Panel Probable Link reports can be found by selecting the *C8 Probable Links - Science Panel 2012* document at:
www.odh.ohio.gov/odhprograms/eh/hlth_as/FactSheets.aspx

C8 Health Project: Medical Monitoring

If the Science Panel found any probable link between C8 exposure and human disease, funds to monitor class-member health became available. A C8 Medical Panel of physicians recently released its recommended protocols for medical monitoring of the mid-Ohio Valley residents exposed to C8.

The Medical Panel’s report, filed in Wood County WV Circuit Court, addresses protocols for initial screening and diagnostic testing. It also recommends that data be collected on the medical monitoring program’s implementation and findings to determine whether future changes are needed.

C8 Health Project: Medical Monitoring (continued)

The Medical Panel also plans to create educational materials about the benefits and hazards of screening to help residents who are eligible for the program.

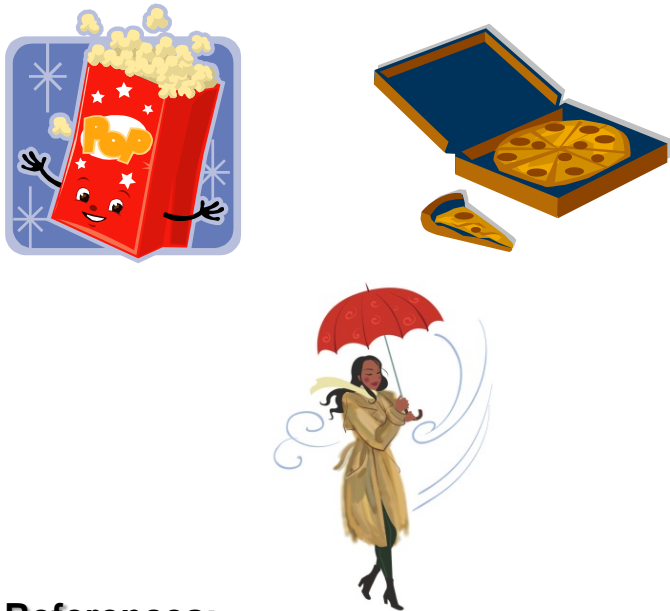
Under the settlement, DuPont agreed to pay as much as \$235 million for medical monitoring programs to help detect the onset of C8 linked diseases among eligible residents. Anyone who was diagnosed with the health conditions linked by the science panel to C8 could pursue a personal-injury claim if they had lived in the water district for at least a year.

How can you avoid exposure to C8?

It is extremely difficult to completely avoid exposure to C8. However, you may be able to reduce your exposure by reducing the use of products that use PFC chemicals in their manufacturing process and/or by reducing your consumption of water known to be contaminated with C8. Water filters containing activated carbon or reverse osmosis membranes have been shown to be effective at removing PFCs from contaminated water supplies.

Important Note: The Ohio Department of Health (ODH) is not suggesting the public stop using products that use or contain C8. There is currently no solid scientific data to make those recommendations at this time.

Note: Not all soil and stain resistance treatments are fluoro-based.



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Shankar, A., Xiao, J., & Ducatman, A., “Perfluorooctanoic Acid and Cardiovascular Disease,” *Arch. Internal Med.* (doi: 10.1001/archinternmed.2012.3393)

Where can you get more information?

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www.odh.ohio.gov/odhprograms/eh/hlth_as/FactSheets.aspx

For questions about C8 and health effects:
Agency for Toxic Substances and
Disease Registry (ATSDR)
Lora Werner
(215) 814-3141
email: lkw9@cdc.gov

