

# Chlorodibenzofurans (CDFs) - ToxFAQs™

## What are chlorodibenzofurans (CDFs)?

Chlorodibenzofurans, or CDFs, are a family of chemicals that contain one to eight chlorine atoms attached to the carbon atoms of the parent chemical, dibenzofuran. There are 135 different types of CDFs called congeners. The different congeners have varying harmful health effects. CDF congeners that contain chlorine atoms at the 2,3,7,8- positions of the dibenzofuran molecule are known to be especially harmful.

There is no known use for these chemicals. Other than for research purposes, they are not deliberately produced by industry. Most CDFs are produced in small amounts as undesirable byproducts during the manufacturing of other chemicals. CDFs can also be released from incinerators and landfill fires.



## What happens to CDFs in the environment?

CDFs in the environment can be found in air, soil, and sediment. Most CDFs are not soluble in water. In the air, CDFs are bound to particles or exist as vapors. CDFs can be removed from the air by snow or rain. CDFs bind to soil and sediment and are not likely to move into groundwater from soil. They accumulate in fish at much higher levels than levels found in the water or sediment. CDFs can also build up in other animals, birds, and people that are exposed to them in their food.

## How can I be exposed to CDFs?

You could be exposed to very small amounts of CDFs in contaminated food, such as meat, fish, and dairy products. You could also be exposed to CDFs in air or soil in areas near incinerators or landfill fires.

## How can CDFs affect my health?

CDFs can stay in your body for a long time after you were exposed. Studies in animals show that CDFs with chlorine atoms in the 2,3,7,8 positions are the most harmful. The most harmful congener appears to be 2,3,4,7,8-pentaCDF (CDF with 5 chlorine atoms in the 2, 3, 4, 7, and 8 positions).

**CDFs are persistent in the environment and body.**

Most of the information on health problems comes from studies in people who were accidentally exposed to food contaminated with CDFs. The amount of CDFs was much higher than from environmental exposures or from a normal diet. CDFs caused skin and eye irritations, including severe acne, darkened skin color, and swollen eyelids with discharge from the eyes. CDF poisoning also caused vomiting and diarrhea, anemia, more frequent lung infections, numbness in arms and legs, and other effects on the nervous system.

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Many of the same effects that occurred in people also occurred in laboratory animals that ate CDFs. Animals also had severe weight loss, and their stomachs, livers, kidneys, and immune systems were seriously damaged. Some animals had birth defects, and in severe cases, some animals died. These effects in animals were seen when they were fed large amounts of CDFs over a short time, or small amounts over several weeks or months.

## Can CDFs cause cancer?

Some studies of people exposed to very high levels of CDFs in their diet have found increases in the risk of cancer. A study in rats exposed to 2,3,4,7,8-pentaCDF found increases in liver and mouth cancers.

The International Agency for Research on Cancer determined that 2,3,4,7,8-pentaCDF is carcinogenic (causes cancer) to humans; the other CDF congeners were not classifiable as to their carcinogenicity in humans. The Department of Health and Human Services and the U.S. Environmental Protection Agency (EPA) have not evaluated whether CDFs can cause cancer in humans.

## Can I get a medical test to check for CDFs?

Tests are available to measure levels of CDFs in blood, body fat, and breast milk. These tests cannot predict whether you will have health problems from exposure to CDFs. Doctor's offices do not routinely offer these tests. If you think you have been exposed to CDFs, call your doctor, nurse, or poison control center.

## How can I protect myself and my family from CDFs?

Most people don't need to take any special steps to avoid CDFs in their daily lives. Children should avoid playing in the dirt near hazardous waste sites to avoid coming in contact with CDFs.

### For more information:

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at <https://wwwn.cdc.gov/dcs/ContactUs/Form>

Go to ATSDR's Toxicological Profile for CDFs: <https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=938&tid=194>

Go to ATSDR's Toxic Substances Portal: <https://wwwn.cdc.gov/TSP/index.aspx>

Find & contact your ATSDR Regional Representative at [http://www.atsdr.cdc.gov/DRO/dro\\_org.html](http://www.atsdr.cdc.gov/DRO/dro_org.html)

