

Dioxins and Furans

What are dioxins and furans?

Dioxins and furans is the abbreviated or short name for a family of toxic substances that all share a similar chemical structure. Dioxins, in their purest form, look like crystals or a colorless solid. Most dioxins and furans are not man-made or produced intentionally, but are created when other chemicals or products are made. Of all of the dioxins and furans, one, 2,3,7,8-tetrachloro-p-dibenzo-dioxin (2,3,7,8 TCDD) is considered the most toxic.

What are dioxins and furans used for?

Dioxins and furans are not made for any specific purpose; however, they are created when products like herbicides are made. They are also created in the pulp and paper industry, from a process that bleaches the wood pulp. In addition, they can be produced when products are burned.

How can dioxins and furans enter and leave your body?

Dioxins and furans can enter your body through breathing contaminated air, drinking contaminated water or eating contaminated food. About 90% of exposure to dioxins and furans is from eating contaminated food. Dioxins and furans can build up in the fatty tissues of animals.

How can you be exposed to dioxins and furans?

You can be exposed to dioxins and furans by eating contaminated food. Dioxins and furans typically stay and build up in the fatty tissues of animals. This means that eating beef, pork, poultry, fish as well as dairy products can be a

source of exposure.

There are several sources of exposure to dioxins and furans. If you work in or near a municipal solid waste incinerator, copper smelter, cement kiln or coal fired power plant you can be exposed to dioxins and furans. Individuals who burn their household waste or burn wood can be exposed as well. Even forest fires can contribute to the creation of small amounts of dioxins and furans.

Dioxins and furans have been found in the air, soil, and food. Dioxins and furans are mainly distributed through the air. However, only a small percentage of exposure is from air. Eating contaminated food is the primary source of exposure.

What are the health effects of exposure to dioxins and furans?

Dioxins and furans can cause a number of health effects. The most well known member of the dioxins/furans family is 2,3,7,8 TCDD. The U.S. Environmental Protection Agency (EPA) has said that it is likely to be a cancer causing substance to humans. In addition, people exposed to dioxins and furans have experienced changes in hormone levels. High doses of dioxin have caused a skin disease called chloracne. Animal studies show that animals exposed to dioxins and furans experienced changes in their hormone systems, changes in the development of the fetus, decreased ability to reproduce and suppressed immune system.

What levels of exposure have resulted in harmful health effects?

The U.S. EPA has set a limit of 0.00003 micrograms of 2,3,7,8-TCDD per liter of

drinking water (ug/L). The Food and Drug Administration recommends not eating fish and shell fish with more than 50 parts per trillion (50 ppt) of 2,3,7,8-TCDD.

Where can you get more information?

Contact your state health or environmental department, or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road, N.E., E-29
Atlanta, Georgia 30333

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile, Chlorinated Dibenzo-p-Dioxins (CDDs)*. Atlanta, GA: U.S. Public Health Service, U.S. Department of Health and Human Services, 1999.
2. Chiefs of Ontario, Effects on Aboriginals from the Great Lakes Environment Project (EAGLE). *Fact Sheet 11: Dioxins and Furans* <http://www.chiefs-of-ontario.org/eagle/factsheet11.htm>
3. U.S. Environmental Protection Agency. *Priority PBTs : Dioxins and Furans Fact Sheet*. Washington, D.C.: Office of Pollution Prevention and Toxics.
4. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Library of Medicine Bethesda, MD, 2001.