



# PUBLIC HEALTH STATEMENT DI-N-OCTYLPHTHALATE (DNOP)

CAS#: 117-84-0

Division of Toxicology

September 1992

This Public Health Statement is the summary chapter from the Toxicological Profile for Di-n-octylphthalate. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™ is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This Statement was prepared to give you information about di-n-octylphthalate and to emphasize the human health effects that may result from exposure to it. The Environmental Protection Agency (EPA) has identified 1,416 hazardous waste sites as the most serious in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal cleanup activities. Di-n-octylphthalate has been found in at least 300 of the sites on the NPL. However, the number of NPL sites evaluated for di-n-octylphthalate is not known. As EPA evaluates more sites, the number of sites at which di-n-octylphthalate is found may increase. This information is important because exposure to di-n-octylphthalate may cause harmful health effects and because these sites are potential or actual sources of human exposure to di-n-octylphthalate.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You can be exposed to a substance only when you come in contact with it. You may be exposed by breathing,

eating, or drinking substances containing the substance or by skin contact with it.

If you are exposed to a substance such as di-n-octylphthalate, many factors will determine whether harmful health effects will occur and what the type and severity of those health effects will be. These factors include the dose (how much), the duration (how long), the route or pathway by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed, and your individual characteristics such as age, gender, nutritional status, family traits, life-style, and state of health.

## 1.1 WHAT IS DI-N-OCTYLPHTHALATE?

Di-n-octylphthalate, also known as dioctyl phthalate, is a colorless, odorless, oily liquid. It does not evaporate easily. There is no evidence that di-n-octylphthalate occurs naturally in the environment. Di-n-octylphthalate is manufactured for many uses. It is commonly used as a plasticizer (a substance added to plastics to keep them soft or more flexible). These plastics are found in products such as carpetback coating, packaging films, medical tubing and blood storage bags, floor tile, wire, cables, and adhesives. Di-n-octylphthalate is also used in cosmetics and pesticides.

## 1.2 WHAT HAPPENS TO DI-N-OCTYLPHTHALATE WHEN IT ENTERS THE ENVIRONMENT?

Di-n-octylphthalate may enter the environment in industrial waste waters, air emissions, and solid wastes from manufacturing and processing operations, from evaporation of the compound from plastics, from the burning of plastic products, and

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by leaking from plastics in landfills into soil or water, including groundwater. Di-n-octylphthalate is expected to stick tightly to soil, sediment, and dust particles once it is released to the environment. If released to the atmosphere, the compound may be deposited on the ground or to surface water in rain or dust particles. Small amounts of the compound can build up in animals that live in water, such as fish and oysters. The compound breaks down into other products mainly by the action of microorganisms. Additional ways di-n-octylphthalate is transformed into other substances include reaction with sunlight and other chemicals present in the atmosphere, reaction with water, and breakdown of the compound in surface waters by sunlight.

### 1.3 HOW MIGHT I BE EXPOSED TO DI-N-OCTYLPHTHALATE?

You may be exposed to di-n-octylphthalate by eating foods contaminated with any of the compound that has leaked from plastic containers, by eating certain foods, such as fish, that have built up high levels of the compound, and by drinking contaminated water. You may also be exposed to di-n-octylphthalate during medical treatments such as blood transfusions and dialysis that use equipment made of plastics containing di-n-octylphthalate. In addition, if you live near a hazardous waste site or an industrial manufacturing or processing facility, you may be exposed through contact with air, water, or soil that may have been contaminated around these sites. Little information is available about the concentrations of di-n-octylphthalate in air, water, or soil. The compound has been measured at 0.06 – 0.94 parts di-n-octylphthalate per trillion parts of air (ppt), in rain at

2.6 –20 ppt, in river water at 1 –310 ppt, and in sediment at less than 5 –25,000 ppt.

Workers in the chemicals and plastics industries may also be exposed to di-n-octylphthalate. The National Occupational Exposure Survey estimated that 10,393 individuals were exposed to the compound in the workplace in 1980.

### 1.4 HOW CAN DI-N-OCTYLPHTHALATE ENTER AND LEAVE MY BODY?

Di-n-octylphthalate can enter your body when you drink water or eat food containing it. We do not know if di-n-octylphthalate enters your body when you breathe air containing it or when it comes in contact with your skin. It is possible that exposure could occur near hazardous waste sites, at manufacturing facilities, or through the use of consumer products containing the substance. We do not know how much you will absorb if you eat or drink it.

Di-n-octylphthalate can also enter your body during medical treatment through the use of plastic tubing or storage bags contaminated with di-n-octylphthalate. Once it enters your body, it breaks down into other chemicals and the health effects of some of these chemicals are not well understood. Di-n-octylphthalate and its breakdown products will leave your body mostly in your urine, but we do not know how quickly that happens. We do not know if the compound or its breakdown products will remain in the tissues.

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### 1.5 HOW CAN DI-N-OCTYLPHthalATE AFFECT MY HEALTH?

No information is available regarding the possible effects caused by di-n-octylphthalate if you breathe, eat, drink, or have skin contact with it. Furthermore, there is no information on the effects of breathing di-n-octylphthalate in laboratory animals. Di-n-octylphthalate has caused death in some rats and mice given very high doses by mouth. Mildly harmful effects have been seen in the livers of some rats and mice given very high doses of di-n-octylphthalate by mouth for short or intermediate durations of time. Brief oral exposures to lower doses of di-n-octylphthalate generally caused no harmful effects.

We have no information on the health effects of di-n-octylphthalate when applied to the skin of humans for long periods of time. Di-n-octylphthalate can be mildly irritating when applied to the skin of animals. It can also be slightly irritating when put directly into the eyes of animals.

We do not know if di-n-octylphthalate causes cancer in humans or animals. Unlike other phthalates such as di(2-ethylhexyl)phthalate, di-n-octylphthalate does not appear to affect the ability of male animals to father offspring [see ATSDR toxicological profile for di(2-ethylhexyl)phthalate for more information on this chemical]. Some birth defects occurred in newborn rats whose mothers received high doses (approximately 5 grams per kilogram of body weight [5 g/kg]) of di-n-octylphthalate by injection during pregnancy. However, humans are not exposed to di-n-octylphthalate this way, and no harmful effects on developing fetuses were seen when mice were given this chemical by mouth.

Di-n-octylphthalate has not been classified for carcinogenic effects by the Department of Health and Human Services, the International Agency for Research on Cancer, or the EPA.

### 1.6 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO DI-N-OCTYLPHthalATE?

Di-n-octylphthalate and its principal breakdown products can be measured in urine, blood, and tissues. However, the information available on these tests is so limited that it is not possible to know if they are specific for di-n-octylphthalate, if they can be used to determine how much you were exposed to, if they can predict whether harmful health effects will occur, or how long the test is useful after exposure occurs. These tests are not available in doctors' offices.

### 1.7 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The government has developed guidelines for di-n-octylphthalate. These are designed to protect the public from the possible harmful health effects of the chemical. However, EPA has recently determined that there is not enough evidence to say that di-n-octylphthalate definitely causes harmful effects in humans or to the environment.

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**1.8 WHERE CAN I GET MORE  
INFORMATION?**

**If you have any more questions or concerns,  
please contact your community or state health or  
environmental quality department or:**

Agency for Toxic Substances and Disease Registry  
Division of Toxicology  
1600 Clifton Road NE, Mailstop F-32  
Atlanta, GA 30333

**Information line and technical assistance:**

Phone: 888-422-8737  
FAX: (770)-488-4178

ATSDR can also tell you the location of  
occupational and environmental health clinics.  
These clinics specialize in recognizing, evaluating,  
and treating illnesses resulting from exposure to  
hazardous substances.

**To order toxicological profiles, contact:**

National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
Phone: 800-553-6847 or 703-605-6000

**Reference**

Agency for Toxic Substances and Disease Registry  
(ATSDR). 1997. Toxicological profile for di-n-  
octylphthalate. Atlanta, GA: U.S. Department of  
Health and Human Services, Public Health Service.

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**[www.atsdr.cdc.gov/](http://www.atsdr.cdc.gov/)**

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