

Phthalates: Recent Information and Legislation

Effective January 1, 2009, California law will ban the manufacture, sale, and distribution of any toy or child care product that contains more than 0.1% of di-(2-ethylhexyl) phthalate (DEHP), dibutyl phthalate (DBP), or benzyl butyl phthalate (BBP). Also, toys or child care articles that can be put in children's mouths are banned if they contain more than 0.1% of diisononyl phthalate (DINP), diisodecyl phthalate (DIDP), or di-n-octyl phthalate (DnOP).

"This law is the product of the politics of fear," says [American Chemistry Council](#) President Jack Gerard. "It is not good science, and it is not good government. Thorough scientific reviews in this country and in Europe have found these toys safe for children to use."

So what do we know about these chemicals called phthalates, where are they used, and just what are they?

Chemistry 101 of Phthalates

Phthalates are relatively small organic molecules that are derivatives of phthalic acid and are chemically classified as esters. You have probably heard of polyesters, which are the same chemical class but not the same chemicals. Here is a list of the common phthalates and their abbreviations:

- DBP (dibutyl phthalate).
- DINP (diisononyl phthalate).
- DEP (diethyl phthalate).
- DEHP (di 2-ethylhexyl phthalate).
- DMP (dimethyl phthalate).
- BBP (benzyl butyl phthalate)
- DNOP (di-n-octyl phthalate).
- DIDP (Diisodecyl phthalate)

Phthalates are used as thickeners, softeners, or controlled release agents in products such as nail polish, and plastics like polyvinyl chloride or PVC. PVC is a rigid plastic (old phonograph records for example) with a relatively high glass transition temperature¹, but addition of a plasticizer to PVC makes it flexible and less brittle. Vinyl is another common acronym--automobile seat covers, rain coats, siding, etc. are commonly referred to as vinyl. In pure form phthalates are

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clear liquids which tend to be thick like motor oil or glycerine--sometimes thicker.

Products that **MAY** contain phthalates include:

- nail polish
- perfumes,
- air fresheners
- vinyl floors
- vinyl siding
- electrical insulation
- Detergents
- Lubricants
- food packaging
- Food and beverage containers
- Soaps
- Paints
- Shampoos
- Toys
- plastic bags
- plastic food wrap

Note that **NOT** all of these products will contain phthalates! Just because it is plastic wrap or a plastic container does not mean phthalates are present--see Green Guide recommendations below.

What is Known about the Physiological Effects of Phthalates?

In October 2008, researchers at the University of Rochester's school of medicine <http://www.urmc.rochester.edu/pr/News/story.cfm?id=1405>

found a link between phthalates and feminizing properties in humans. Richard Stahlhut, M.D., M.P.H., a Preventive Medicine resident at the University of Rochester, says "While we can't say yet that phthalates are a definite cause, I am certain they are on the list of chemicals that demands careful study." The research was done on 106 boys from four U.S. states, a relatively small number, and the results need to be independently verified. It's not known if the exposure reduces fertility in adulthood.

In February 2008, a University of Washington study (<http://depts.washington.edu/pehsu/pdf/phthalate%20QA.pdf>) tested the urine of 163 infants and found that all the babies had at least one type of phthalate in their system while 81 per cent had at least seven different types. Among children who had recently had their hair shampooed or had lotion applied to their body, levels of phthalates were higher,

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the study said. ***The study cautioned, however, that the products themselves were not tested for phthalates.***

Researchers also noted there was no proof the chemicals found in the babies' urine were harmful. The study was published in the journal Pediatrics.

Legislation

California became the first U.S. state to ban products for children and babies containing more than residual quantities of phthalates. As of 2009, any children's product sold or distributed in California cannot contain more than one-tenth of one per cent of phthalates.

In August 2008, U.S. President George W. Bush signed a bill partially banning phthalates. The bill outlaws the use of three types of phthalates in children's products. Three other phthalates have also been temporarily banned, as officials continue to study the effects of the chemicals.

The European Union has outlawed the use of DEHP, DBP and BBP in children's products. DINP, DNOP and DIDP are also banned in toys that children under the age of three might put in their mouths. Cosmetic manufacturers are also not permitted to use DEHP and DBP in the formulation of their products.

According to The Green Guide <http://www.thegreenguide.com/greenguide/buying-guide/plastic-containers>, a website and magazine devoted to greener living and owned by the National Geographic Society, the safest plastics for repeated use in storing food are made from high-density polyethylene (HDPE, or plastic #2), low-density polyethylene (LDPE, or plastic #4) and polypropylene (PP, or plastic #5). Most Tupperware products are made of LDPE or PP, and as such are considered safe for repeated use storing food items and cycling through the dishwasher. Most food storage products from Glad, Hefty, Ziploc and Saran also pass The Green Guide's muster for health safety.

1. Glass transition temperature is the temperature at which a polymer changes from a glassy brittle state to a fluid flexible state. PVC has a glass transition temperature of about 80 degrees centigrade, well above room temperature and it is therefore brittle at room temperature. Low density polyethylene (LDPE) on the other hand has a glass transition temperature below 0 degrees. Therefore it is flexible and not brittle at normal room temperatures, and would not be expected to require a plasticizer to keep it flexible.