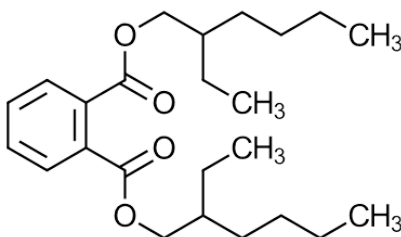


CAS 117-81-7

Di-2-ethylhexyl Phthalate (DEHP)

$C_{24}H_{38}O_4$



Summary of Health Effects

Di-2-ethylhexyl Phthalate (DEHP) may cause cancer in humans based on animal studies. In animals, DEHP affects the reproductive system and how unborn babies develop.

How is DEHP used?

95% of the DEHP produced is used in polyvinyl chloride (PVC) as a plasticizer.¹ DEHP is used in children's products such as baby pants, dolls, toys, and shoes. It is also used in consumer products including furniture upholstery, wall coverings, tablecloths, floor tiles, shower curtains, garden hoses, swimming pool liners, rainwear, automobile upholstery and tops, packaging film and sheets, sheathing for wire and cable, medical tubing and blood storage bags.² The Danish Environmental Protection Agency has detected DEHP in various children's products including toys, dolls, wrist watches, nursing pillows, sporting and swimming equipment, beach balls, dinner mats, balance balls, bags, sandals and T-shirts.³

Toxicity: What are its health effects?

DEHP is listed as a carcinogen and considered a developmental toxicant by the National Toxicology Program (NTP) and the State of California under Proposition 65.^{2,4}

Hepatocellular carcinomas (cancerous liver tumors) were observed in rodents fed DEHP.⁵

The European Union classified DEHP as a category 1 endocrine disruptor.⁶

The NTP and other studies have observed skeletal and cardiovascular malformations, neural tube defects, developmental delays, intrauterine death, and adverse effects on reproductive tracts as a result of DEHP exposure.^{2,4} Perinatal exposure of mice to monoethylhexyl phthalate, a metabolite of DEHP, has shown to increase fat storage, serum lipid, and glucose levels.⁷

A 2010 study identified a negative association between urinary phthalate concentration and insulin-like growth factor I (IGF-I) in Danish boys.⁸

Of eight phthalates studied by the EPA, DEHP was found to be one of the three most toxic to terrestrial organisms, fish, and aquatic invertebrates.⁹

Exposure: How can a person come in contact with it?

A person can come in contact with DEHP from skin contact with consumer products, by eating

or drinking contaminated food and water, or by breathing it in.¹

DEHP has been detected in foods and has been shown to migrate out of plastic packaging. A 2011 study determined that diet is the most significant pathway of exposure to certain phthalates including DEHP.^{10,11,12} High levels of DEHP were detected in poultry, oils and fats and cream-based dairy products.¹⁰ A 2013 study detected DEHP at the highest concentrations of all phthalates measured in food (except beef) gathered from an Albany, New York market.¹³

Urinary metabolites (break down products) of phthalates reflect recent exposure to the parent phthalate.¹⁴ The 2014 National Health and Nutrition Examination Survey (NHANES) results showed that there are several metabolites of DEHP in the urine of more than 98% of the U.S. population from 1999-2002.¹⁴

Other Information

In 2005, the European Commission banned DEHP in all toys and child care articles.¹⁵ In 2008, the Consumer Protection Safety Commission placed a ban prohibiting the sale of children's toys or child care articles containing greater than 0.1% DEHP by weight.⁸

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