

Hazardous Chemicals in Polyvinyl Chloride (PVC) Children's Products

Many childcare articles such as teethers, bath toys, stroller covers, bibs, diaper covers, mattress covers, inflatable swimming pools, shoes and raincoats sold in Massachusetts are made of PVC. Children can come into contact with the toxic additives in these products through chewing or sucking, normal hand-to-mouth behavior and through their release in air and dust as the products age.

Chemicals	Health Impacts
<p>Phthalates</p> <p>Most commonly used :</p> <ul style="list-style-type: none"> di-isononyl phthalate (DINP) di-iso-decyl phthalate (DIDP) di-n-octyl phthalate (DNOP) dibutyl phthalate (DBP)¹ butylbenzyl phthalate (BBP) di(2-ethylhexyl) phthalate (DEHP)² 	<p>Liver and kidney lesions: reproductive abnormalities, including testicular atrophy, altered development of reproductive tissues and subtle effects on sperm production (maybe through endocrine disruption); cell line transformations; and cancers, including those of the liver, kidney, and mononuclear cell leukemia. These effects are generally quantitatively though not qualitatively different between phthalates. The developing male reproductive system appears to be the sensitive organs. A July 2004 article links phthalates to asthma and allergic symptoms in children. Phthalates plasticizers account for more than half the weight of some flexible PVC products. About 95% of phthalates produced are used in PVC.</p> <p>[Strong animal evidence; suggestive human evidence; some children evidence through exposure via medical devices]</p>
<p>Metals</p> <ul style="list-style-type: none"> Lead Cadmium Organotins Antimony Barium Zinc 	<p><i>Lead</i> damages the nervous system, leading to decreased learning ability and behavioral deficits. It is also a reproductive toxin and a carcinogen. [Strong animal, human and children evidence]</p> <p><i>Cadmium</i> is a carcinogen, causes kidney damage and impacts brain development. [Strong animal evidence, strong human occupational evidence]</p> <p><i>Organotins</i> can cause liver damage, general malaise, nausea, gastric pain, dryness of the mouth, vision disturbance, and shortness of breath. Some evidence of endocrine disruption and impacts on the immune system as well as reproduction. They are used as stabilizers and bactericide in children's PVC products.</p> <p>Other toxic metals such as <i>antimony</i>, <i>barium</i> and <i>zinc</i> are used in PVC and can also leach out during use.</p> <p>[More research needed but suggestive animal evidence on antimony, organotins, barium and zinc]</p>
<p>Other PVC additives of concern</p> <ul style="list-style-type: none"> Nonylphenols Bisphenol A Formaldehyde Flame retardants 	<p>Nonylphenols are endocrine disruptors, bioaccumulative, and widespread in the environment. Evidence of their human reproductive effects led the EU to propose a ban. [Strong animal evidence; some suggestive human and children evidence]</p> <p>Bisphenol A is an endocrine disruptor shown to cause adverse reproductive and development-al effects in animals. It has been measured in human blood, umbilical blood and placental tissue at levels within the range shown to cause developmental effects in animals. ³ [Strong animal evidence; suggestive human evidence; more research needed on children]</p> <p>Formaldehyde is not a necessary additive to PVC but has been detected, It is a carcinogen and has been linked to asthma and other respiratory ailments. [Strong animal evidence; strong human evidence; suggestive children evidence]</p>

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¹ Dibutylphthalate (DBP) and butylbenzylphthalate (BBP) mainly used in printing inks, show estrogenic activity

² Removed from toys intended for the mouth through a 1986 voluntary agreement in the US but still present in other childcare articles.

³ Our Stolen Future <http://www.ourstolenfuture.org/NewScience/oncompounds/bisphenola/bpauses.htm>

A Sample of International Actions on Polyvinyl Chloride (PVC) Children's Productsⁱ

Country	Targets	Age Group	Types of Products
Austria	Phthalates	under 3	products made from synthetics for children under 3 intended to be chewed, sucked or frequently put in the mouth; sale of toys made with the use of phthalates
France	Phthalates: DINP, DIDP, DEHP; DBP, DNOP, BBP	under 3	one-year ban on childcare items made from soft PVC containing phthalate softeners – may now be permanent
Greece	Phthalates	under 3	ban on the import and sale of all soft PVC toys as a genre
Mexico	Soft PVC	“small children”	ban on the import of soft PVC toys and withdraw these products from sale
Norway	Phthalates as a class, any “o-phthalic acids”	under 3	production, distribution, import and export of toys and other products containing phthalate plasticisers
Denmark	Phthalates	under 3	ban phthalates in toys and baby articles
Sweden	Phthalates as a class	under 3	ban on phthalates in toys for years old and a prohibition on the use of other chemical additives from replacing phthalates
Finland	Phthalates: DINP, DEHP, DBP, DIDP, DNOP, BBP	under 3	childcare products that are intended for oral use
Germany	Phthalates	under 3	ban on phthalates in any toy designed to be used by a child
Italy	Phthalates: DINP, DEHP, DBP, DIDP, DNOP, BBP	under 3	ban of soft PVC toys containing phthalate additives
Japan	Phthalate: DINP	Under 6	ban on toys designed to be mouthed containing DINP
Iceland	Soft plastic containing phthalates	under 3, also products which could be used as a toy...	bans the manufacture, importation and distribution of toys and children's products made of soft plastic if they contain phthalate of a concentration exceeding 0.05% of the product weight or part of it : a. toys for children under three years old (0-36 months); b. products for children under three years old intended to be, or which may expected to be, gnawed or sucked on, for example, teething rings, bibs, bath implements, etc.; and, c. products not falling under (a) and (b) but which may be used as a toy for children under three years old because of the products' appearance, including the type of material, shape and decoration.
EU	Phthalates: DINP, DEHP, DNOP, DIDP, BBP and DBP	under 3	Emergency ban currently prohibits the placing on the market of soft PVC toys and childcare articles including their parts which are intended to be placed in the mouth by children under three years old containing more than 0.1% by weight of one or more of the six phthalates listed – new legislation coming soon... see <i>AHT Factsheet Hazards of PVC Children's Products</i>

ⁱ References for the Sample of International Actions on PVC Children's Products :

Safe Kids Now Toxic Free Products: <http://environet.policy.net/health/products/toxic toys/factsheets.vtml>

Unofficial Translation of French text <http://www.tid.gov.hk/english/aboutus/tradecircular/cic/eu/1999/files/ci10899a.pdf>

Unofficial Translation of Greek text <http://www.tid.gov.hk/english/aboutus/tradecircular/cic/eu/1999/ci5999.html>

<http://odin.dep.no/md/engelsk/regelverk/forskrifter/022051-200004/dok-bn.html>

http://www.tid.gov.hk/english/aboutus/tradecircular/cic/eu/1999/eu_listing99.html

Turner Toys http://www.turnertoys.com/PVC_framepage1.htm

Joe DiGangi *Phthalates in medical devices* <http://eu.greenpeace.org/downloads/chem/pvcmedical1999.pdf>