

# Phthalates, PVC and children toys – an emerging safety issue

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**[www.arnika.org](http://www.arnika.org) <http://english.arnika.org/>**



# PVC

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- PVC (or vinyl) is the second largest-selling plastic in the world
- Uses include window frames, pipes, flooring, wallpapers, car seats, cable insulation, credit cards, medical products (such as blood bags, IV tubing) and much more.
- PVC plastic is used to manufacture many products, including food wraps, children's toys and infant products.

## Usage of PVC

- Building - 56%
- Packaging - 15%
- Consumer goods 10%
- Electronics - 9%
- Agriculture - 5%
- Other - 5%

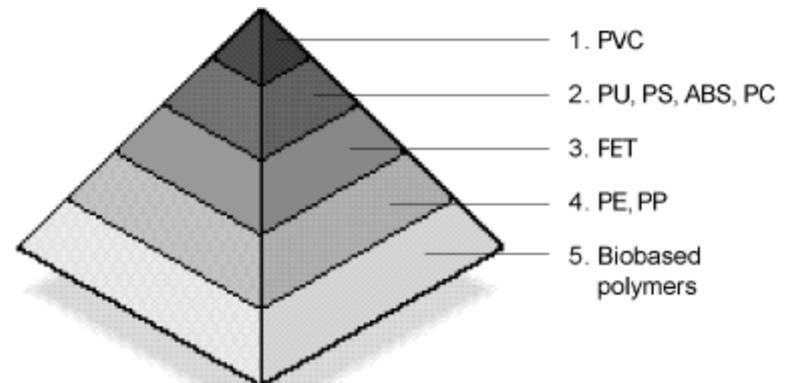


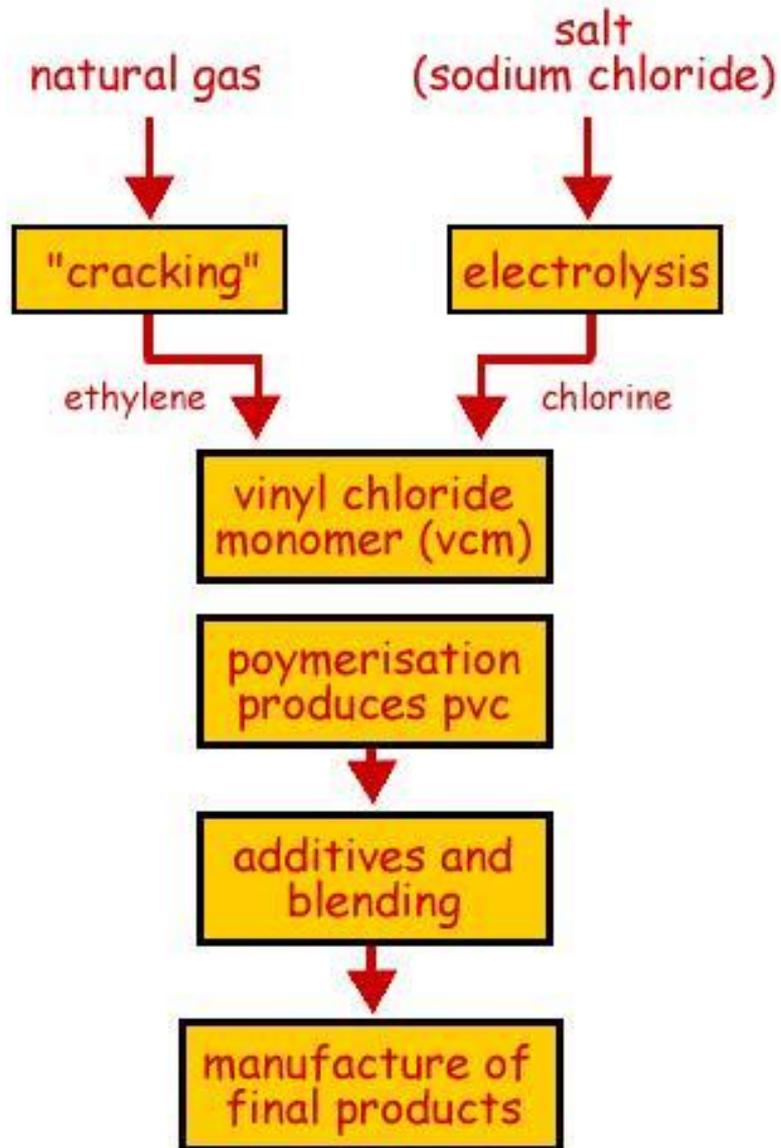
# Why is PVC problematic?

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The lifecycle of PVC, from manufacturing to use and disposal, uses and releases hazardous chemicals that are toxic to health and the environment.

Toxic chemicals are generated during PVC production (which uses chlorine, made usually at chloralkali plants using mercury). The combination of chlorine and ethylene generates persistent toxic chemicals and PBTs, including polychlorinated dioxins and furans, PCBs, hexachloroethane, and hexachlorobutadiene.





# Problematic disposal of PVC products



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Complicated recycling because of high chlorine content (it cannot be mixed with other plastics and has to be separated)

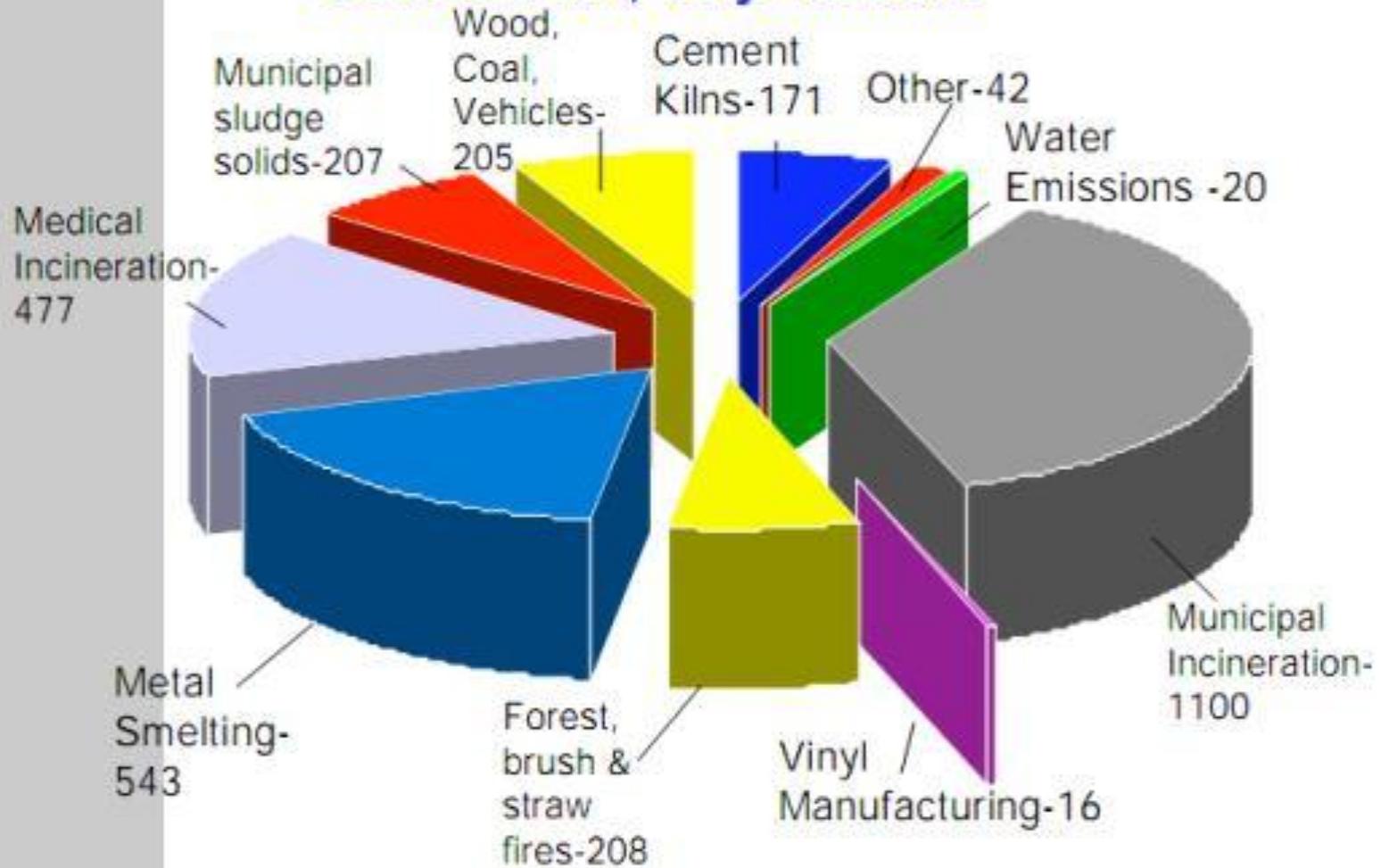
- Countless varieties of additives in different vinyl products (we are able to control the final content of the recycled product)

➔ Reason why PVC ends up in landfills and municipal incinerators

- Dioxin (formed when PVC is burned) released from incinerator stacks travels on air currents, sometimes for very long distances, before eventually falling to the earth to be consumed by animals
- Unborn children are exposed to dioxin in their mother's womb, while breastfeeding infants receive dioxin from their mothers' breast milk
- Hazardous open burning – PVC is simply burned in open pits or in the backyards

# Dioxin-Like Compound Emissions, 1995 Grams, TEQ, 1995

Source: EPA, Vinyl Institute



# Problematic additives

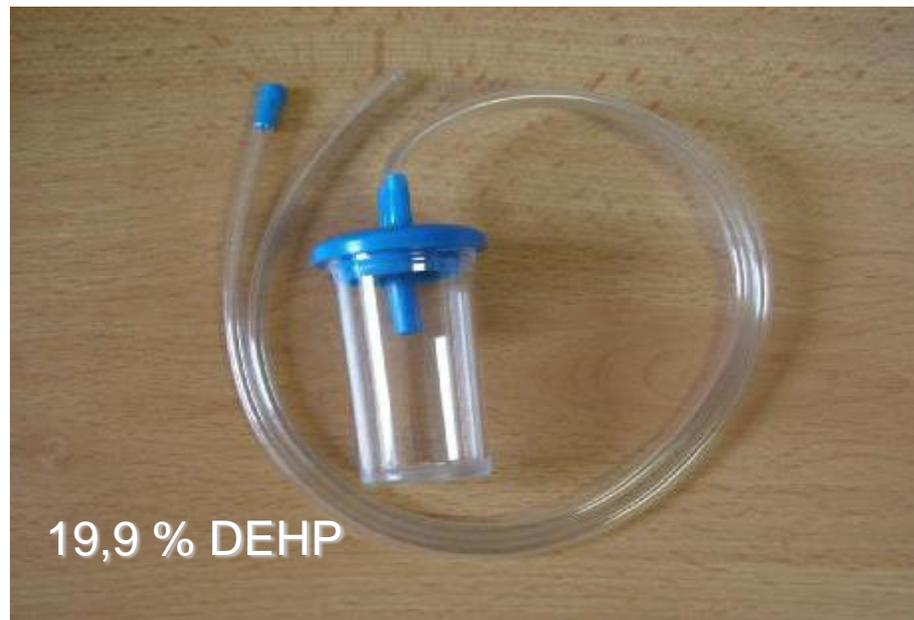
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- Phthalates – for flexible applications, PVC requires the addition of plasticizers
- Phthalates do not chemically bind to vinyl, they can leach out!
- Some studies suggest that phthalates can interact synergistically with other common chemical contaminants and may play a role as endocrine disruptors, can affect blood pressure and may cause asthma (especially phthalates released from PVC flooring).
- Phthalates in products such as flooring have been associated with pediatric respiratory ailments
- European Union legislative - DEHP, BBP, DBP, DINP, DIDP and DNOP - are totally banned for use in any toys or childcare articles where their concentration exceeds 0,1 % by mass of the plasticized material.

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- **Lead.** Lead is used as a heat stabilizer and pigment in PVC.
  - **Cadmium.** Cadmium compounds are used as stabilizers to prevent degradation of PVC from heat and light. Cadmium is also found in various pigments used to color PVC products.
  - **Children may be exposed to these hazardous substances by playing with, chewing on, or sucking on the toys.**

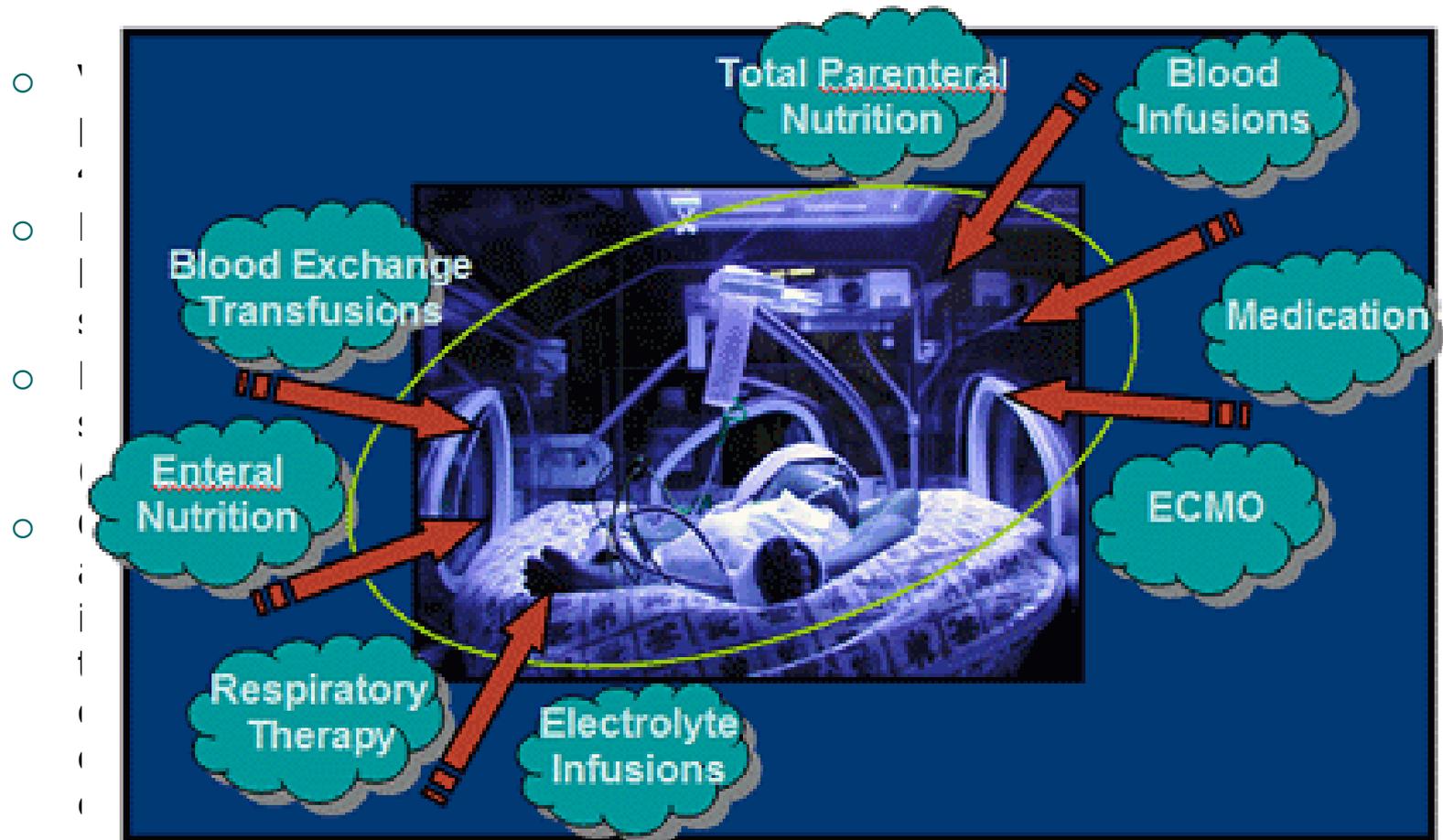






Di(2-ethylhexyl) phthalate

# Medical devices



Exposure, 100 times the dietary exposure advisories for the US and EU.

- (1) Calafat et al. 2004 (2) Green et al. 2005 (3) Koch et al. 2006

# Arnika's Campaign for phasing out PVC (2006 – 2009)

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- Negotiation with manufacturers, retailers to reduce PVC food wraps
- Cooperation with children daycare centers on phasing out the PVC toys and other PVC equipment, free lectures for parents
- Cooperation with hospitals (result: 5 hospitals reduced PVC medical devices, mostly on neonatal units)
- Public petition (over 11 000 signatories)

## TATO KACHNIČKA VAŠEMU ZDRAVÍ NEPŘIDÁ

Je totiž vyrobena z PVC!



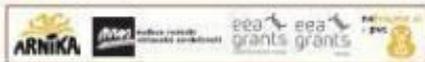
V PVC jsou toxické látky, na které obzvláště dětský organizmus reaguje velmi citlivě.

PVC poznáte snadno, protože se značí číslem 3 v trojúhelníku nebo slovně.



Tyto látky mohou způsobit například poruchy imunity nebo problémy s reprodukcí. PVC není vhodné na výrobu hraček, potravinových obalů ani zdravotnických pomůcek.

[www.pvc.arnika.org](http://www.pvc.arnika.org)



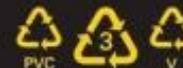
## TATO KACHNIČKA NENÍ ŽÁDNÝ ANDÍLEK

Je totiž vyrobena z PVC!



PVC je plast, který obsahuje zdraví nebezpečné látky.

PVC poznáte snadno, protože se značí číslem 3 v trojúhelníku nebo slovně.



Označení PVC najdete buď přímo na výrobku, na jeho obalu nebo v příbalových informacích. Pokud výrobek není označen žádným symbolem, poradí Vám prodejce či výrobce.

[www.pvc.arnika.org](http://www.pvc.arnika.org)





# Switch to PVC-free materials



- Architects, building contractors, and consumers need to be aware of the environmental and health impacts caused by the production and disposal of PVC.
- Consumers have to learn how to choose safer and more environmentally friendly substitutes
- To be the responsible buyer means to study the alternatives and make their own educated choices regarding alternatives to PVC.
- Manufacturers should label the material content of products so that consumers can easily identify safer products
- Phase out the most problematic products like PVC toys and packaging and switch to safer materials





**PVC**



**V**



**vinyl**



# PVC Policies Across the World

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- Sweden first proposed restrictions on PVC use in 1995 and is working toward discontinuing all PVC uses.
- In Spain, over 60 cities have been declared PVC-free.
- Germany has banned the disposal of PVC in landfills as of 2005, is minimizing the incineration of PVC, and is encouraging the phase out of PVC products that cannot easily be recycled.
- Over 100 healthcare institutions around the world are reducing or phasing out PVC and Phthalates
- many of the world's biggest companies have committed to phase out PVC and switch to safe and healthy products. These include companies such as Apple, Honda, Johnson and Johnson, Microsoft, Nike, or Sony

# Thank you for attention!

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- Mark Rossi, 2002: Neonatal Exposure to DEHP (di-2-ethylhexyl phthalate) and Opportunities for Prevention; HCWH
- Swan et al. (2005). Decrease in anogenital distance among male infants with prenatal phthalate exposure
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- Hanson, R.L. (1983) Phthalate ester migration from polyvinyl chloride consumer products. Phase 1 final report. Report prepared for the US Consumer Product Safety Commission, 51pp.
- <http://www.besafenet.com/pvc/about.htm>
- [http://www.noharm.org/all\\_regions/issues/toxins/pvc\\_phthalates/](http://www.noharm.org/all_regions/issues/toxins/pvc_phthalates/)