Connecticut Department of Public Health
Environmental & Occupational Health Assessment Program
Environmental Health Section
410 Capitol Avenue, MS # 11EOH, PO Box 340308
Hartford, CT 06134-0308
Telephone: (860) 509-7740 Fax: (860) 509-7785
www.ct.gov/dph/toxicology

FACT SHEET

June 2009

Plastics Primer

Bisphenol A (BPA) is a chemical found in some plastic water and baby bottles. Phthalates are plasticizers found in other types of water bottles and microwavable containers. Both of these chemicals have hormonal effects, which raises questions about the safety of certain plastic food and beverage containers. Polycarbonate (PC, recycling #7) is highest in BPA and polyvinyl chloride (PVC, recycling #3) is highest in phthalates. Phthalates, BPA and other chemicals can leach out of the plastic container and get into your food or water. Heating plastic containers may enable the chemicals to leach out faster and in greater quantity. Even under these conditions, the amount leached is tiny, so the exposure on any given day should not make you worry. However, daily exposure to these chemicals over time may contribute to a long-term health risk. The concern is greatest for exposures during pregnancy and in early childhood.

People who want to protect themselves from possible health effects may choose to use glass or stainless steel containers instead of plastic. These materials can safely be used to store food and drinking water, and glass is good for microwave cooking.

The following table is provided as a guide. Information in the table may change in the future as we learn more, and as manufacturers change their formulations. The recycling number refers to the imprint on the bottom of the container, which indicates the type of plastic, and whether it is recyclable.

Recycling No.	Chemical Name	Appearance	Uses	Leaching & Other Implications	Comments/Recommendations
	**PETE or PET** Polyethylene terephthalate	Clear, thin, flexible	Beverage & food containers, polyester and other synthetic fibers for textile & packaging, thermoformed sheets, engineering resins.	-Leaches numerous chemicals and metals. -Leaching increases upon storage, high temperatures, or re-use of bottles. -Easy to recycle.	-Reasonable for occasional use. -Avoid re-use of these bottles. -Avoid storing beverage bottles in a hot car.
	**HDPE** High density polyethylene	Cloudy, thick, rigid or flexible	Milk & water bottles, detergent, shampoo, motor oil bottles, grocery bags, recycling bins, car stops, playground equipment, and plastic lumber.	Some BPA leaching is possible, but overall leaching potential is low.	Good for low temperature applications like milk jugs & cold water storage in refrigerator.
	**PVC or** Polyvinyl chloride	Soft, flexible plastic	Rubber duckies, dolls, meat wrap, plastic pipes, plastic fencing, and non-food bottles.	-Leaches phthalates and BPA. -Can create dioxin when burned, which is toxic.	-Overall high leaching potential. -Avoid when possible, especially with regards to toys and food & drink containers.

Recycling No.	Chemical Name	Appearance	Uses	Leaching & Other Implications	Comments/Recommendations
	**LDPE** Low density polyethylene	Thin, flexible	Plastic bags, food wrap, various containers, dispensing bottles, wash bottles, tubing, and various molded laboratory equipment.	-Possibly leaches plasticizers called adipates (a less toxic phthalate replacement). -Health implications uncertain.	-Relatively low leaching risk at low temperatures. -Not typically recycled.
	**PP** Polypropylene	Soft semi-rigid plastic like yogurt tubs.	Auto parts, industrial fibers, food containers.	-Low leaching potential. -Minimal health concerns for current uses.	-Good for low temperature applications. -Not typically recycled.
	**PS** Polystyrene	Hard rigid plastic (solid polystyrene), Foamed polystyrene (Styrofoam).	-Solid PS: disposable cutlery, cafeteria trays, plastic models, desk accessories, CD & DVD cases, toys, smoke detector housings. -Foamed PS: packing materials, insulation board, foam drinking cups.	-Leaches styrene & possibly other chemicals (e.g., toluene, benzene).	Best to avoid, especially in drink cups or food containers.
	**OTHER Plastics,** including polycarbonate (PC)*	Hard rigid plastic films, sports bottles.	PC* is the hard, clear or colored plastic that many water and baby bottles had been made from.	-Older PC bottles leach bis-phenol A (BPA). -New hard, clear, plastic water bottles labeled as PC (# 7) can be BPA-free. They are made with Tritan, a type of plastic that can still leach some plastic ingredients (manufacturer trade secret).	-Use PC or Tritan water bottles only occasionally, and only with cold water. -Heating bottle/contents increases BPA leaching.* Alternatives: -Stainless steel water bottles. -Glass water & baby bottles. -Look for BPA-free plastic baby bottles (although they may leach other chemicals).
Metal Bottles	Aluminum with liner	Aluminum bottle with liner (light weight, prone to denting); liner typically contains BPA.	Re-useable drinking water bottle.	Proprietary liner with limited test data suggests leaching of BPA into water is minimal; further evaluation is needed.	Minimal concern if water is kept fresh & cold.
Metal Bottles	Stainless Steel	Hard, heavy weight, non-dentable bottle.	Re-useable drinking water bottle.	Should be free of leaching concerns.	**Lowest leaching alternative for drinking water, along with glass.**

*Avoid high temperature uses because of potential to leach BPA or other ingredients. Avoid microwaving, pouring/storing hot liquids, and leaving liquids in #7 bottles in a hot car. Replace liquid as often as possible to keep it cool and fresh.