

PVC: The Most Toxic Plastic

From the Children's Health Environmental Coalition

The worst plastic, from both an environmental and health standpoint, is polyvinyl chloride, or PVC, commonly known as vinyl. It is found in a wide variety of products – from food packaging to children's toys, plumbing and building materials to medical devices – but in every case alternatives to it exist.

Everyday Encounters With PVC

PVC [food packaging](#) can include plastic trays in boxed cookies or chocolates, candy bar wrappers, and bottles. [Cling wraps](#), especially the kind used commercially to wrap meats, cheeses and other foods, can also be PVC. Unfortunately, this means that many people are exposed to plasticizing chemicals through food wrapping every day.

Traces of toxic chemicals, known as adipates and [phthalates](#) (pronounced "tha-lates"), used to soften PVC can leak out into foods. The risk of leaching is especially high with fatty foods and at [higher temperatures](#).

PVC is also commonly used in teething rings and [soft squeeze toys](#) for young children, beach balls, bath toys, dolls and other products, such as knapsacks, raincoats, and umbrellas. Health concerns for children who play with soft PVC toys center once again on the toxic softeners known as [phthalates](#). In May, 2001, Greenpeace released a [report](#) which examined the level of phthalates and other hazardous chemicals in children's products and household items and found high levels of phthalates in many cases.

More PVC products

Of ten billion pounds of polyvinyl chloride (PVC) resin produced annually in the U.S., 60 percent is used in construction. The most prevalent use of PVC in construction is for [piping](#) of water, gas and sewer drainage. Vinyl is used in 66 percent of all American kitchens as [flooring](#). Other construction uses include: window frames, doors, wire sheathing, imitation leather, furniture and [vinyl wallpaper](#).

Many common household products and office supplies are made of PVC plastic, from PVC-covered paper clips to felt-tip pens, vinyl venetian blinds and shower curtains, to wastepaper baskets. Unfortunately, most plastics used for packaging and consumer products are not labeled, with the exception of bottles (see below).

Harm to Humans in PVC Manufacturing

The production of plastic accounts for the single largest use of [chlorine](#) and PVC is the most common of all chlorinated plastics. Vinyl chloride, the chemical used to make PVC, is a known human carcinogen, according to the World Health Organization's [International Agency for Research on Cancer \(IARC\)](#). Workers in PVC manufacturing facilities and residents of surrounding communities can be affected by exposure to these chemicals. Some studies have found higher rates of testicular cancers and a rare form of liver cancer among workers in PVC plants. These cancer-causing chemicals and [lead](#), the nerve-damaging metal often added to PVC, have contaminated water, soil and air around these facilities, which are often located in poor communities. According to Greenpeace, low-income, African-American communities in particular are disproportionately impacted by PVC manufacturing facilities.

Trashing the Food Chain

The manufacture of PVC and PVDC (polyvinylidene chloride, a close relative of PVC) also creates and disperses [dioxins](#), which include the most toxic man-made chemical known. Released into air or water, [dioxins](#) enter the food chain, where they accumulate in fatty tissues of animals, including humans. In fact, the U.S. Environmental Protection Agency estimates a 1 in 1000 chance of contracting cancer from [dioxin](#) exposure through a typical American diet. Dioxin may also affect children's development and damage immune functions. PVC can generate dioxin again when it is incinerated as household or medical waste.

Too Close for Comfort

A 1998 article in *Consumer Reports* announced that Consumers Union (CU) scientists had found that cheddar cheese packaged in clear PVC cling wrap contained levels of an adipate called DEHA (di-2-ethylhexyl adipate) that raised health concerns. Because animal studies had shown that DEHA causes reproductive problems, birth defects and liver tumors in mice, [CU called for more investigation by the U.S. Food and Drug Administration \(FDA\)](#) into plasticizing chemicals and their health impacts.

"Adipates [and phthalates] simply haven't been tested for their hormone effects, since these tests weren't an issue a generation ago," says Ned Groth, Ph.D., a senior scientist at CU. Dr. Groth notes that though the FDA is aware that these compounds are leaching into food, there is no conclusive toxicity data about them.

"It takes an overwhelming amount of data to overturn an FDA regulation," he adds, indicating that any change in policy may be many years away.

In the meantime, since PVC cling-wrapped foods are widely available, most of us can easily be getting exposed to plasticizing chemicals through food wrapping every day. Children are particularly at risk since they're often more vulnerable to, and are exposed to higher amounts of chemicals than adults are. Phthalate and adipate studies have shown harm to animal young, especially those prenatally exposed.

Of growing concern is the role of these chemicals as [hormone disruptors](#), chemicals that interfere with normal functioning of hormonal systems. Fetuses and children are most vulnerable to hormone disruption because these systems are still developing in their young bodies.

It's not just cling wrap we need to worry about. In some cases, packaging made from PVC contains over 50% plasticizers, added to increase flexibility of this inherently brittle plastic. PVC packaging for food can include plastic trays in boxed cookies or chocolates, candy bar wrappers, and bottles. If you can't avoid PVC-wrapped products, you can reduce your exposure to DEHA by slicing or scraping off a thin layer from cheeses and meats. Store the rest in a glass, ceramic, or less-toxic plastic container.

The Final Insult: It's Less Recyclable

Because it contains a variety of additives and lacks a uniform composition, PVC is far less recyclable than other plastics. Its quality degrades after only two or three "cycles." Recycling operations are burdened by having to carefully sort out PVC since it melts into corrosive gases at lower temperatures than other plastics contaminating them, ruining equipment and causing health concerns. Greenpeace has identified PVC as the least recycled of the six or so major common plastics used in consumer, household and construction projects. The EPA estimates that less than 0.5% of total post-consumer PVC was recovered or reprocessed in 1994.

Just say "No" to PVC

The only way to avoid PVC is to [identify it first!](#) On packaging, look for the #3 or the letters "PVC," often found next to the three-arrow "recycling" symbol. For other PVC products, you'll have to ask the manufacturers what materials were used. Fortunately, some companies are changing their own consumption patterns. For example, IKEA is no longer using PVC in the manufacture of their furniture, wallcoverings and textiles.

It may seem that we cannot get along without PVC these days, but in all cases [alternatives exist](#). And as we learn more about the negative impacts of PVC – on our individual health and the environment – we can reject PVC products and actively seek out other options in all aspects of our lives.