

PVC: The Poison Plastic

2003-08-18

Most common plastics pose serious threats to human health and the environment. The problems of plastics include extreme pollution from production, toxic chemical exposure during use, hazards from fires, and their contribution to the world's growing solid waste crisis. But one plastic stands alone: PVC, throughout its lifecycle, is the most environmentally damaging of all plastics.

PVC is the most environmentally damaging plastic. The PVC lifecycle -- its production, use, and disposal -- results in the release of toxic, chlorine-based chemicals. These toxins are building up in the water, air and food chain.

The result: severe health problems, including cancer, immune system damage, and hormone disruption. No one can escape contamination: Everyone, everywhere has measurable levels of chlorinated toxins in their bodies.

What is PVC?

Over the past few decades, Polyvinyl Chloride (PVC) plastic, commonly known as "vinyl," has become one of the most widely-used types of plastics. We find it all around us: in packaging, home furnishings, children's toys, automobile parts, building materials, hospital supplies, and hundreds of other products. Its advantages are that it is highly versatile and relatively inexpensive. But the price we pay for a low-cost and seemingly harmless piece of PVC pipe or soft vinyl toy is far steeper than it may at first appear.

In fact, this commonplace plastic is one of the biggest contributors to the flood of toxic substances saturating our planet and its inhabitants. PVC contaminates humans and the environment throughout its lifecycle during its production, use and disposal. While all plastics pose serious threats to human health and the environment, few consumers realize that PVC is the single most environmentally damaging of all plastics. Since safer alternatives are available for virtually all uses of PVC, it is possible to protect human health and the environment by replacing and eventually phasing out this poison plastic.

Chlorine: The Deadly Building Block in PVC

PVC production is the largest and fastest-growing use of chlorine -- accounting for nearly 40 percent of all chlorine used in the United States. Chlorine is the basic building block of our most infamous toxic problems: CFCs which destroyed the ozone layer, the dioxin contamination at Love Canal and Times Beach, Agent Orange, PCBs and DDT pesticides. Hundreds of chlorine-based toxins are building up in the air, water and food chain. Many of these chemicals, called organochlorines, are resistant to breakdown and will remain in the environment for decades to come. Scientific studies reveal that these chemicals are linked to severe and wide-spread health problems, including infertility, immune system damage, impaired childhood development, hormone disruption, cancer and many other harmful effects.

Due to the chemical structure of organochlorines, humans and animals are unable to efficiently expel them from their bodies. Instead, many of these compounds accumulate in fatty tissue, resulting in contamination levels thousands or millions of times greater than is found in the surrounding environment. No one can escape contamination; every one of us has measurable amounts of chlorinated toxins in our bodies. And some organochlorines can impact on human life before birth, during the most delicate stages of development -- a disastrous toxic legacy for future generations.

Dioxin: PVC's Lethal Legacy

Dioxin and dioxin-like compounds are unintentionally created whenever chlorine-based chemicals are produced, used or burned. Evidence suggests that, throughout its entire lifecycle, PVC is responsible for a greater share of the nation's annual dioxin burden than any other industrial product. Large amounts of dioxin are produced during the various stages of PVC production, and the abundance of PVC items in medical waste and garbage is one reason incinerators are considered the largest sources of dioxins. Thousands of accidental fires in buildings containing PVC result in releases of dioxin in ash and soot, contaminating both the environment and the affected building.

Dioxin is known as one of the most toxic chemicals ever produced. In its ongoing study of dioxin, the U.S. Environmental Protection Agency (EPA) suggests that there is no safe level of dioxin exposure. Thus any dose, no matter how low, can result in severe health damage. The EPA has also concluded that the levels of dioxin currently found in most adults and children are already high enough to present significant health threats to the American public.

A Case for Environmental Justice

Because dioxin and other chlorinated chemicals can migrate around the world, the harmful effects of PVC production are felt everywhere. Some communities, however, are hit far harder than others. Of the 14 U.S. plants that make VCM (vinyl chloride monomer, the building block used to make PVC) all but one are located in Louisiana and Texas.

These plants release huge amounts of toxic chemicals into the environment around them. Discharged pollutants impact nearby drinking water supplies and on-site incinerators spread dioxin and other hazardous compounds into the air. Nearby communities, farms, and fishing areas suffer the consequences.

Many vinyl facilities are located in poor communities with little political clout. Government policies sanction and encourage this practice. In the U.S., poor African-American communities are disproportionately impacted. This is a classic case of environmental racism.

In the most severe cases, entire communities have been literally wiped off the map. In 1987, the town of Reveilletown, Louisiana became so contaminated that all 106 residents were relocated and every structure torn down, even the church. Management of the nearby Dow Chemical factory followed suit soon after, buying out the entire town of Morrisonville, Louisiana.

By cutting PVC use, you are striking a blow for environmental justice, and supporting the life and death struggle being waged today by local residents on the front lines of the grassroots toxics movement.

Because PVC on its own is almost useless, it must be combined with a number of additives in order to give it the properties desired in the final product. These additives include toxic plasticizers (such as phthalates), stabilizers containing dangerous heavy metals (such as lead), fungicides, and other toxic substances. Because these additives are not chemically bound to the PVC, the PVC product itself can be immediately dangerous to the consumer. Additives can wash out, pass into other materials or be lost to air. Examples of potential human exposure are as numerous as the PVC products themselves. The smell of new car interiors is a familiar example of what experts call chemical "fogging" from PVC products. Plasticizers have been shown to be directly transferred from PVC plastic "cling film" to food. Children teethe on vinyl toys which contain toxic additives. The U.S. Consumer Product Safety Commission issued a warning in 1996 when it discovered that PVC miniblinds were giving off lead dust, which can have brain-damaging effects on children.

Increasing scientific evidence suggests that many of these chemicals are disrupting the hormone systems of wildlife, leading to birth defects, infertility, reproductive difficulties and developmental problems in offspring. There is increasing evidence that the same trends are being observed in humans world-wide, including decreased sperm counts, rising rates of certain cancers, deformities of the reproductive organs, mental problems such as attention deficit disorder, and weakened immune systems.

Building Fires and PVC

The use of PVC in construction (the largest overall use of PVC) doubled between 1980 and 1995. Because so much PVC is used in construction and household items, accidental building fires have become increasingly more dangerous for firefighters and building occupants. Although PVC is flame resistant, PVC products release toxic hydrogen chloride gas when heated. These corrosive gases can spread faster than flames, trapping building occupants before they have a chance to escape. Hydrogen chloride gas is lethal when inhaled.

According to fire experts, it is not unusual for people caught in building fires to be killed by toxic PVC fumes before the flames actually reach them. As builders and policymakers become increasingly aware of the safety risks and potential expenses resulting from PVC fires, more restrictions are being enacted against the use of PVC in building construction.

An Enemy of Recycling

Recycling of PVC plastic is not a solution to the environmental problems created during its production and use. While most plastics do not get recycled, PVC is the worst offender -- it's the least recyclable of all plastics. This is because PVC items contain so many additives that recycling would be impractical and expensive.

The numbers are pathetic. According to the latest EPA figures, less than 0.5 percent of total post-consumer PVC was recovered for reprocessing in 1994.

Toward Safer Materials

The rapid growth of the vinyl industry is proceeding in the face of clear evidence of the serious health risks posed to workers, their families and neighboring communities. There is compelling evidence that it is now possible -- and crucial -- to implement a rapid transition to safer materials.

The good news is that this industrial transition can be accomplished in a manner that is fair to all involved -- the plastic manufacturers, industrial workers, and host communities. PVC can be replaced with safer materials in virtually all cases. Substitutes for PVC include traditional materials such as clay, glass, ceramics and linoleum. In those cases where traditional materials cannot be used as a replacement, even chlorine-free plastics are preferable to PVC. As consumers increasingly demand PVC-free products, and as the environmental and health costs of PVC are recognized, practical alternatives will become more economically viable. Proposals for transition planning have already been developed by labor and environmental organizations.

Numerous companies and governments have enacted PVC restrictions and material substitution policies. Large companies such as Proctor and Gamble, Mattel, and the Body Shop have phased out PVC packaging. BMW, Herlitz, IKEA, Opel, Sony-Europe and Volkswagen have all announced policies to eliminate PVC uses. Big construction projects such as the Eurotunnel between England and continental Europe were completed without the use of PVC. PVC is restricted from some city high-rises and military and aerospace projects. Due to increased demand, in various countries the market Hundreds of European communities have instituted restrictions on the use of PVC in public buildings. The Swedish Parliament voted in 1995 to phase out soft PVC and rigid PVC with additives that are already identified as harmful. In Denmark, government officials are currently considering the phase out of PVC by the year 2000.

As part of the games' environmental design, the 2000 Summer Olympics in Sydney are being planned with an effort to minimize the use of chlorinated compounds, including PVC.

For a list of USA-based suppliers, manufacturers, and importers of alternatives and PVC-free building materials, please see our [online resource guide](#) to PVC alternatives.

What You Can Do

1. Write to your Congressional Representatives and the Environmental Protection Agency (EPA). Demand that they halt the expansion of the PVC industry and begin the phase-out of PVC. Write to:

The Honorable _____
United States House of Representatives
Washington, DC 20515

The Honorable _____
United States Senate
Washington, DC 20510
Carol Browner

EPA Administrator
U.S. Environmental Protection Agency
401 M Street S.W.
Washington, DC 20460

Avoid buying vinyl/PVC products whenever possible, and reduce your overall use of plastics. (PVC is sometimes identified with the following symbol.)

2. Contact companies if you're not sure what a product is made of. Demand PVC-free alternatives.

3. Spread the message. Talk to firefighters, architects, engineers, plumbers, doctors, hospital workers and toy manufacturers about the dangers of PVC. Ask them to support a PVC phase-out.