



PVC, the Poison Plastic: Unhealthy for Our Nation's Children and Schools



PVC is the most toxic plastic for our health and environment. No other plastic contains or releases as many dangerous chemicals. Unfortunately the poison plastic is widespread in schools across the nation.

Healthy schools free from toxins are critical to a child's health and well-being. Most of the time spent during the years that children's bodily and intellectual capacities are developing is spent inside school buildings. Due to funding crunches across the nation, our schools are in trouble and many are actually threatening our children's health and ability to learn on a daily basis by using unhealthy building materials and products. Schools that do not have responsible policies on protecting children's health are forcing students and staff to be exposed to toxic chemicals. An emerging toxic plastic of concern, polyvinyl chloride (PVC or vinyl), is used widespread in schools across the nation.

PVC—the Poison Plastic

PVC is the most toxic plastic for our health and environment. No other plastic contains or releases as many dangerous chemicals. These include dioxins, phthalates, vinyl chloride, ethylene dichloride, lead,

cadmium, and organotins. There's no safe way to manufacture, use or dispose of PVC products.¹

Children More At Risk from Toxic Chemicals

Children are not "little adults" - their developing brains and bodies, their metabolism and behaviors make them uniquely vulnerable to harm from toxic chemicals such as those released by the PVC lifecycle:

- Exposure begins in the womb through the mother's exposures to toxic chemicals. Infants ingest chemicals through breast milk, formula and contact with their environment.
- Rapid brain development in the fetus, infants and young children make them more susceptible to harm from chemicals that may impair brain function and development.
- For their weight, children eat, drink and breathe more than adults - so pound for pound they take in a greater quantity of toxic contaminants.

A small exposure translates into a big dose.

- Children put things in their mouths and spend a lot of time on the floor and ground, so they may ingest chemicals from toys, containers, dirt and dust on a regular basis.ⁱⁱ

Congress Bans Phthalates in Toys What About Phthalates in Schools?

Phthalates are chemicals used to soften or plasticize PVC products such as flooring, which can be released from PVC into the air inside schools. The phthalates cling to dust and can then be breathed in by children and teachers.ⁱⁱⁱ Over 90% of all phthalates are used in PVC products^{iv} including many found in schools. Some phthalates such as DEHP have been linked to reproductive problems including shorter pregnancy duration^v and premature breast development in girls^{vi} and sperm damage^{vii} and impaired reproductive development in boys.^{viii} Some studies have also found a correlation between phthalates and obesity,^{ix} a growing problem for children across the country.^x Phthalates are highest in children ages 6 to 11, and in women.^{xi} In 2008, President Bush signed legislation banning phthalates such as DEHP in children's toys.^{xii}

While phthalates have been banned from PVC toys, they're widespread in PVC products used in schools.

PVC, Asthma and Autism—Are School Children, Teachers, and Custodians at Risk?

Asthma is a serious, sometimes life-threatening respiratory disease that affects 7 million American children and 16 million adults.^{xiii} An average of one out of every 13 school-age children has asthma. In fact, asthma is a leading cause of school absenteeism: 14.7 million school days are missed each year due to asthma.^{xiv} In recent years, a number of studies have found a correlation between phthalates emitted from PVC building products and asthma:

- A study published in 2009 found a statistically significant link between PVC flooring, asthma, and autism spectrum disorder. The study found that children who live in homes with vinyl floors, which can emit phthalates, are twice as likely to have autism.^{xv}
- A 2008 study found an association between concentrations of phthalates in indoor dust and wheezing among preschool children.

Why PVC-Free Schools?

- ✓ PVC is the most toxic plastic for our health and environment, and is common in schools.
- ✓ Children are uniquely vulnerable to chemical exposure.
- ✓ Congress just recently banned phthalates in children's toys, yet they are widespread in PVC found in schools.
- ✓ A number of studies have linked phthalates and PVC in building materials with asthma in children and adults.
- ✓ Children are required to spend their days in schools, so school districts have a responsibility to provide healthy school environments.
- ✓ The average age of a public school building is nearly 50 years old. As a result, one-third of schools need extensive repair and replacement, which should not include the use of toxic PVC building materials.
- ✓ Building materials such as PVC flooring represent the largest share of the PVC market, and schools are huge institutional purchasers that can have a significant impact on the marketplace.

The presence of PVC flooring in the child's bedroom was the strongest predictor of respiratory ailments.^{xvi}

- A study of 10,851 children found the presence of floor moisture and PVC significantly increased the risk of asthma.^{xvii}
- A study among personnel in four geriatric hospitals found asthma symptoms were more common in the two buildings with signs of phthalate degradation in PVC flooring.^{xviii}
- A study of workers in an office building found they were diagnosed with adult-onset asthma at a rate of about 9 times higher than expected. The researchers identified PVC flooring as the source of chemicals, such as 2-ethyl-1-hexanol, 1-butanol, in the air.^{xix}
- A study of adults working in rooms with plastic wall covering materials were more than twice as likely to develop asthma. These researchers pointed to other recent epidemiologic studies in children conducted in Norway, Finland, Sweden, and Russia that also found links between PVC, phthalates, and respiratory problems.^{xx}

PVC Flooring and Indoor Air Quality

Today's sealed and insulated buildings often result in indoor air that is actually more polluted than the air outside. In short, indoor air pollutants can inhibit a child's ability to concentrate and learn in the school environment. EPA studies of human exposure to air pollutants indicate that indoor levels of pollutants may be two to five times — and occasionally more than 100 times — higher than outdoor levels. The good news is, indoor air pollution can be reduced through good planning and building maintenance.^{xxi} PVC flooring and other PVC products can contribute to poorer indoor air quality as PVC products can off-gas chemicals called volatile organic compounds (VOCs). A study by the California Air Resources Board found forty chemicals, some of which are toxic, off-gassing from PVC flooring.^{xxii} Another study found PVC flooring can emit chemicals for a period of at least



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nine months, indicating a persistent risk of toxic exposure.^{xxiii} A study of PVC shower curtains found just one new vinyl shower curtain can release 108 VOC's into the air over a 28-day period. A number of the chemicals are classified as hazardous air pollutants by the EPA, and even worse, many are untested.^{xxiv}

PVC Flooring and Unhealthy Cleaning Products

PVC flooring often requires the use of toxic cleaners to keep it durable and shiny. This wax and strip maintenance has long been a source of health concern due to the toxic VOCs such as formaldehyde (a known carcinogen) used in the maintenance products. A life cycle study of flooring installation and maintenance found that the amount of VOCs emitted from a single waxing of a floor may be comparable to the amount of VOCs emitted from the flooring itself over its entire life. While some PVC manufacturers have formulated "no wax" finishes for some of their flooring products, many PVC flooring products still require the use of toxic maintenance products.^{xxv}

PVC and Dioxin - One of Most Toxic Chemicals Studied

PVC's lifecycle is uniquely responsible for the release of Dioxins, some of the most toxic chemicals ever studied by the EPA. Dioxins are a class of chemicals

unintentionally created from the manufacture and disposal of PVC products, such as vinyl flooring in schools.^{xxvi} Dioxin is a potent cancer-causing agent and is considered to be a “known human carcinogen” by the World Health Organization’s International Agency for Research on Cancer^{xxvii} and the U.S. Department of Health and Human Services’ National Toxicology Program.^{xxviii} According to the US EPA, the levels of dioxin-like compounds found in the general population may cause a lifetime cancer risk as high as one in 1,000.^{xxix} This is 1,000 times higher than the generally “acceptable” risk level of one in a million. Dioxin also causes a wide range of non-cancer effects including reproductive, developmental, immunological, and endocrine effects in both animals and humans.^{xxx}

Many Companies Going PVC-Free

Some of the biggest corporations in the world have recognized the dangers of PVC’s lifecycle and have

adopted policies to reduce or phase out PVC. These include: **Wal-Mart, Nike, Apple, Microsoft, Target, Sears, Kmart**, and many more!

Where is PVC Hiding in Your School?

PVC is found in many building materials and other products in schools including:

- Flooring
- Roofing
- Carpeting
- School supplies such as 3-ring binders, backpacks, lunchboxes, and raincoats
- Office supplies such as binders, computers and paperclips
- Playground equipment and more!

What Can I Do? Take Action for Healthy PVC-Free Schools

Safer and cost-effective alternatives are already available for virtually every PVC product in our nation’s schools. Here’s how you can help today:

- **Encourage your school** to renovate or build their school with PVC-free building materials such as PVC-free linoleum flooring and TPO roofing.
- **Encourage your school district, county or state** to adopt a healthy PVC-free policy to avoid the use of PVC building materials and office supplies in favor of safer cost-effective alternatives.
- **Educate parents, teachers and students!**
Organize a screening of Blue Vinyl and Sam Suds for your PTA, teacher’s union, or concerned students.
- **Encourage organizations**, such as teacher’s unions and parenting groups, to endorse the campaign.
- **Back to school – go PVC-free!** When buying your back-to-school supplies, shop for PVC-free products.
- **Get involved today!** If you’re interested in getting involved, contact CHEJ at mike@chej.org or 212-964-3680.

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