

Sorting out the Vinyls – When is “Vinyl” not PVC?

Vinyl is commonly used as a shorthand name for polyvinyl chloride (PVC) plastic as used in a range of products from flooring to siding to wall covering. Most commonly, when a product is referred to as “vinyl,” it is comprised primarily of PVC. Occasionally it also may refer to polyvinylidene chloride (PVDC) a closely related compound, used in food wraps (‘Saran’) and other films, that shares most of the same environmental health problems.

In chemistry, however, the term “vinyl” actually has a broader meaning, encompassing a range of different thermoplastic chemical compounds derived from ethylene. In addition to PVC, “vinyls” in building materials also include:

- **ethylene vinyl acetate (EVA)**, used in films, wire coating and adhesives
- **polyethylene vinyl acetate (PEVA)** a copolymer of polyethylene and EVA used in shower curtains, body bags
- **polyvinyl acetate (PVA)**, used in paints and adhesives, such as white glue, and
- **polyvinyl butyral (PVB)**, used in safety glass films.

What differentiates PVC from the other vinyls is the addition of a chlorine molecule (the chloride “C” in PVC and PVDC). Chlorine is the source of many of the environmental health concerns with PVC, such as the generation of dioxin, a highly carcinogenic chemical produced in both the manufacture and disposal of PVC. Due to its persistent and bioaccumulative nature (it travels long distances without breaking down and concentrates as it moves up the food chain to humans) dioxin has become a global problem and an international treaty – the Stockholm Convention on persistent organic pollutants (POPs) - now prioritizes the elimination of processes that produce dioxin.

Some of the non chlorinated vinyls (EVA, PEVA, PVA and PVB) are now beginning to be used as direct substitutes for PVC. EVA has been in use for several years as a chlorine free substitute for PVC – primarily in non building materials like toys and athletic shoes, but occasionally as a protective film or binder. In the building industry, post-consumer recycled PVB is now beginning to be used to replace PVC in carpet backing. Absence of chlorine alone does not make these other vinyls the final answer in the search for green polymers. There are still plenty of toxic challenges and untested chemicals in the life cycle of any petrochemical product. As is the case with most other polymers competing with PVC, however, **the weight of available evidence indicates that the absence of chlorine in the formula will generally render the lifecycle environmental health impacts of PVB and the other vinyls less harmful than PVC** and initial study is bearing this out. Like the polyolefin plastics, the use of PVB and the other non chlorinated vinyls represents a step forward in the search for alternatives to PVC.

In summary, with the exception of paints, glues and certain films, **“vinyl” as a product description almost always means made of PVC. The term vinyl in ethylene vinyl acetate (EVA), polyethylene vinyl acetate (PEVA), polyvinyl acetate (PVA), and polyvinyl butyral (PVB), however, does not refer to PVC and does not raise the same concerns associated with chlorinated molecules like PVC.**

When in doubt about the use of the term “vinyl”, ask if it is PVC.

Note on other halogens: Fluorine and bromine belong to the halogen family of elements along with chlorine. Many environmental health researchers are concerned that fluorinated and brominated compounds will turn out to be even worse than chlorinated polymers, such as PVC. For more see the sidebar on an [Environmental Building News](#) article on wire. HBN suggests avoiding all brominated or fluorinated and chlorinated compounds wherever possible.