Polyvinyl Chloride

Economical, versatile polyvinyl chloride (PVC, or vinyl) is used in a variety of applications in the building and construction, health care, electronics, automobile and other sectors, in products ranging from piping and siding, blood bags and tubing, to wire and cable insulation, windshield system components and more.

Uses & Benefits

Vinyl is versatile: it can be as rigid as industrial pipes, as pliable as plastic wrap, and as thin and flexible as wallcovering. It can also be completely clear or matched to any color desired.

Building and Construction

About three-quarters of all vinyl produced goes into long-lasting building and construction applications. Life-cycle studies show PVC/vinyl is effective in protecting the environment, in terms of low greenhouse gas emissions and conservation of resources and energy.

Because it is strong and resistant to moisture and abrasion, vinyl is ideal for cladding, windows, roofing, fencing, decking, wallcoverings, and flooring. Vinyl does not corrode like some building materials, does not require frequent painting and can be cleaned with mild cleaning products.

- Siding and Windows
  
  Vinyl helps produce siding and window frames that are extremely durable, affordable, and help conserve energy when heating and cooling homes. In fact, vinyl windows have three times the heat insulation of aluminum windows.

- Wiring and Cables
  
  Vinyl is able to withstand tough conditions behind building walls – such as exposure to changing temperatures and dampness – for the life of the building. As a result, it is one of the most prevalent and trusted materials used in electrical wiring and cables.

- Water Pipes
  
  PVC helps conserve energy and water by creating virtually leak-free pipes that are not prone to corrosion and resist environmental stress. PVC breakage rates are as low as one percent of the breakage rates of cast metal systems. The lack of build-up in PVC piping improves functionality and increases energy efficiency.

Packaging

Because it is durable, dependable and light weight, flexible PVC helps packaging do its job to maintain the integrity of the products inside, including medicines. Clear vinyl is used in tamper-resistant over-the-counter medications and shrink-wrap for consumer products. Rigid vinyl film is used in blister and clamshell packaging to protect medicines, personal care products and other household goods.

Healthcare

Vinyl plays a critical safety role in dispensing life-saving medicine through IV bags and medical tubing. The advent of the PVC blood-collection bag was a significant breakthrough because blood bags are flexible and unbreakable, enhancing the development of ambulatory medicine and serving as the foundation for modern blood banks.

Household Products

PVC’s affordability, durability and water resistance make it ideal for rain coats, boots and shower curtains.
Answering Questions about PVC/Vinyl

**Is PVC a major source of dioxin?**

Dioxin comes from many sources, according to EPA. PVC is an extremely small source, so small that levels of dioxin in the environment would be essentially unchanged even if vinyl were not being manufactured and used every day in important products. Overall dioxin levels in the environment have decreased by more than 90 percent since 1987, during which time production and use of vinyl have more than tripled.

**Are phthalate plasticizers safe?**

Phthalate plasticizers are added to vinyl when flexible products are being made. Phthalates have been thoroughly studied and reviewed by a number of government scientific agencies and regulatory bodies world-wide and these agencies have concluded that phthalates used in commercial products do not pose a risk to human health at typical exposure levels. Information collected by the Centers for Disease Control and Prevention over the last 10 years indicates that, despite the fact that phthalates are used in many products, exposure is extremely low—significantly lower than any levels of concern set by regulatory agencies.

**What about heavy metals?**

Stabilizers are added to vinyl formulations to lubricate and control the integrity of the material in the manufacturing process, or for coloring. These additives are usually based on compounds of tin, calcium, barium and/or zinc. They are held tightly in the material. In the United States, lead and cadmium have been almost entirely phased out of vinyl consumer products.

Tested, Effective, Affordable

Vinyl is largely derived from salt — an abundant and inexpensive resource — and ethylene, which is derived from natural gas. Vinyl products consume less energy, generate fewer emissions, and save more energy than many other products.

PVC is used in the production of hundreds of products that consumers encounter in everyday life, and many more that are encountered less frequently but are nevertheless important in construction, electronics, healthcare and other applications. PVC is used in these applications because of its low cost and desirable physical and mechanical properties. It is fabricated efficiently into a wide range of both rigid and flexible products. PVC also has inherent flame resistance. Substitutes for PVC materials may be available, but often the alternative materials and processes are not as efficient or substitution costs are high.

Safety Information

- Many vinyl products are certified to meet special requirements set by regulatory authorities or other standards. PVC pipe for delivering drinking water must be certified by NSF International to conform to U.S. Environmental Protection Agency (EPA) safety regulations. Medical and food-contact products must meet U.S. Food and Drug Administration regulations.
- While some new vinyl products have an odor, the small amount of volatile organic compounds (VOCs) emitted will dissipate quickly through normal ventilation — in fact, tests have shown that the initial odor of vinyl wall coverings dissipates much faster than odors from most paints. Vinyl products are able to meet low VOC requirements in standards such as FloorScore®, Green Label Plus and GREENGUARD.
- Vinyl is manufactured by polymerizing (linking together) a chemical called vinyl chloride. Regulations strictly limit levels of vinyl chloride in the workplace and in emissions from manufacturing plants. Manufacturers convert as much vinyl chloride into PVC as possible to make maximum use of this raw material, then apply steam to strip out the remaining vinyl chloride so that levels in the finished vinyl are negligible.

More Information

The Vinyl Institute
www.vinylinfo.com