

Siding with Vinyl



Vinyl Fact Sheet

Each year, the Vinyl Siding Institute fields questions about the properties, performance and environmental impact of vinyl products. To address these questions, the following facts are adapted, with their permission, from the Vinyl Institute's publication, *Vinyl: A Little Guide to the Big Questions*, 2007. This fact sheet includes excerpts that relate to rigid vinyl products like vinyl siding, as well as additional information that may be of interest.

Ingredients from Nature Vinyl, also known as PVC or polyvinyl chloride, starts with two simple building blocks: chlorine (57%) from common salt and ethylene (43%) from natural gas. The resulting compound, ethylene dichloride, is converted at high temperatures to vinyl chloride monomer (VCM) gas. Through the chemical reaction known as polymerization, VCM becomes a stable powder, polyvinyl chloride resin. Used for more than a half century, vinyl is one of the most analyzed and tested materials.

Energy Efficiency Vinyl is the most energy-efficient major plastic. It is largely derived from salt – an abundant and inexpensive resource. Vinyl products consume less energy, generate fewer emissions and save more energy than many competitive products.

Durability Vinyl is the most widely used plastic for building and construction. Because it's strong and resistant to moisture and abrasion, vinyl is ideal for siding, windows, roofing, fencing and decking. Vinyl will not rot or corrode like many other materials and does not need cleaning with harsh chemicals or painting.

Excellent Fire Performance (Also see VSI's publication *Siding with Safety*.) Vinyl's chemical makeup makes it inherently flame resistant. Rigid vinyl building products are slow to ignite, their flame spread is slow and they cease to burn after the flame source is removed. The products of vinyl combustion are no more hazardous than those produced by burning many other common materials, both natural and synthetic.

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DID YOU KNOW?

- Dioxin emissions in the United States have decreased by more than 90% since 1987, according to the U.S. Environmental Protection Agency.
- During this same time period, there has been considerable growth in the production of vinyl.

Vinyl is one of few materials that meet the stringent National Fire Protection Association (NFPA) requirements for insulating electrical and data transmission cables, including in plenum applications.

Recyclability Virtually all scrap, trim and off-spec material from the vinyl production process is recycled. This means that 99% of all manufactured vinyl is made into products – not sent to landfills. About 18 million pounds of post-consumer vinyl are also recycled annually. A tremendous amount of post-consumer material is not available because it is still in service as siding, pipe and other products that last decades.

Landfilling Vinyl products are extremely resistant to the corrosive conditions found in landfills and will not break down or degrade under them. In fact, vinyl is often used to make landfill liners and caps because it is inert and stable.

The U.S. Environmental Protection Agency (EPA) benchmark report, *Characterization of Building-Related Construction and Demolition Debris in the United States*, lists the 36 typical constituents in the construction and demolition debris stream. Vinyl siding is not among them.*



Chlorine Vinyl won't harm the atmosphere. Once chlorine is processed into vinyl, it is chemically locked into the product more tightly than it was in salt. When vinyl is recycled, landfilled or disposed of in a modern incinerator, chlorine gas is not released into the atmosphere.

Dioxin Vinyl is an extremely small source of dioxin, so small that levels in the environment would be essentially unchanged even if vinyl were not being manufactured and used every day in important products. The vinyl industry has studied and worked to reduce its contribution to dioxin. In fact, vinyl manufacturing creates only grams of dioxin per year. Other dioxin sources include forest fires, volcanoes, burning wood in

*Franklin Associates. *Characterization of Building-Related Construction and Demolition Debris in the United States* (Report No. EPA 530-R-98-010). (Table C-1). Prepared for the U.S. Environmental Protection Agency. June 1998.

Life Cycle Assessment

fireplaces, vehicle emissions and manufacture of other building materials. Overall dioxin levels in the environment have been declining for decades, according to data from the U.S. Environmental Protection Agency (EPA). During this time, production and use of vinyl more than tripled.

Hydrogen Chloride (HCl) HCl is a byproduct of burning vinyl, but it does not incapacitate or become dangerous until it reaches concentrations far higher than those that have been measured in actual fires. Because it is an irritant with a pungent odor, burning HCl serves as a warning to evacuate. Furthermore, HCl air concentration declines rapidly as it adheres to surfaces.

Incineration Vinyl can be safely incinerated and its energy recaptured and reused. A large-scale study by the American Society of Mechanical Engineers found no link between the chlorine content of waste like vinyl and dioxin emissions from controlled combustion processes. Instead, the study stated, the scientific literature is clear that the operating conditions of combustors are the critical factor in dioxin generation.

Worker Safety In 1973, doctors at a company making vinyl chloride monomer (VCM), an intermediate material in the vinyl production chain, noticed several cases of a rare form of liver cancer among the employees. Within two years, the U.S. Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency (EPA) issued regulations reducing workplace exposure and environmental emissions, and the entire vinyl industry completely re-engineered its production operations. There have been no documented cases of this cancer among vinyl workers whose careers began after the regulation took effect.

Since it debuted decades ago, vinyl has been an important part of life. Always changing with the times to become more efficient and safe, vinyl has proven itself time and again to be a responsible and relevant material. Its benefits have been confirmed by a lifetime of usage, testing and research, and no doubt these benefits will continue to be seen in the years ahead.



Many experts agree that to truly understand a product's environmental impact, its entire life cycle should be evaluated. This is known as life cycle assessment (LCA). Environmental effects associated with a product's manufacture can be counterbalanced over time by a long, beneficial, low-impact life. For example, emissions associated with vinyl window production are far outweighed by decades of energy-saving benefits.

- Vinyl products perform favorably in terms of energy efficiency, thermal-insulating value, low contribution to greenhouse gases, low maintenance and product durability.
- Recent life cycle studies show the health and environmental impacts of vinyl building products are comparable to or less than the impacts of most alternatives.



Get to Know Vinyl Siding Better

Want to know even more about vinyl siding? At the Vinyl Siding Institute (VSI), we're always eager to share more facts. We appreciate the willingness of the Vinyl Institute (VI) to provide information from *Vinyl: A Little Guide to the Big Questions*, 2007.

The Vinyl Siding Institute, Inc. is the trade association for manufacturers of vinyl siding and other polymeric siding and suppliers to the industry. Through initiatives such as the *VSI Vinyl Siding Product Certification Program* and the *VSI Certified Installer Program*, we strive to improve the quality of today's vinyl siding and to educate on the many benefits that have made it the number one choice of exterior cladding. To learn more, visit www.vinylsiding.org.

The Vinyl Institute, a national trade association formed in 1982, is the leading advocate for the responsible manufacture, life cycle management and promotion of vinyl. The VI sponsors scientific and technical research, maintains a technical library and monitors regulatory activity affecting the industry. In addition, the VI funds an education program for architects and designers called *Vinyl In Design*. For more information, visit www.vinylinfo.org.

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