It's a simple goal in modern-day home life: keep cool in the summer and warm in the winter, while keeping energy costs low. The excellent thermal properties of vinyl windows make that goal attainable. The specially designed insulating airspaces in vinyl window frames – combined with their low conductivity – make them a formidable barrier to heat transfer. But their environmental performance in other areas also is impressive. This brochure will take a look at vinyl window attributes and their relationship to environmental performance.

Supported by AAMA’s Vinyl Material Council
VIB-0205

$125–$340 annual savings on energy bills by replacing single pane windows with ENERGY STAR® vinyl windows

1 Savings estimates based on regional population-weighted regional average annual energy use for a 2,000 square foot, single story, detached house with 15% glazing, gas heat and electric air conditioning. Estimates calculated using RESFEN 3.1 with default operational assumptions and window library. Estimates use state average utility rates (EIA, August 2004). Actual savings will vary by climate region and home characteristics.

Source: U.S. Department of Energy, ENERGY STAR® for Windows, Doors and Skylights
It’s a simple goal in modern-day home life: to keep cool in the summer and warm in the winter, while keeping energy costs low. The excellent thermal properties of vinyl windows make that goal attainable. The specially designed insulating airspaces in vinyl window frames—combined with their low conductivity—make them a formidable barrier to heat transfer. But their environmental performance in other areas is also impressive. This brochure will take a look at vinyl window attributes and their relationship to energy costs.

<table>
<thead>
<tr>
<th>FRAME MATERIAL</th>
<th>U-FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>insulated fiberglass</td>
<td>0.3-0.5</td>
</tr>
<tr>
<td>aluminum (no thermal break)</td>
<td>0.6-1.3</td>
</tr>
<tr>
<td>aluminum (with thermal break)</td>
<td>1.7-2.4</td>
</tr>
<tr>
<td>wood and vinyl</td>
<td>0.3-0.5</td>
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</table>

Vinyl windows are so durable that the vast majority of vinyl windows are still in use more than 25 years after they were installed. Therefore not candidates for end-of-life or post-consumer recycling. Twenty million pounds of that was recycled at the post-consumer recycling stage, which counts for less than one percent of dioxin releases to the environment. Some concern has been expressed over the formation of dioxin during vinyl manufacture or incineration since the vinyl industry has subjected its products to extensive testing to demonstrate that they are safe to use. It maintains an active testing program to address new environmental issues.

Vinyl windows are impervious to rot, rust, corrosion, scratching, and are approximately 100% recyclable. Twenty million pounds of vinyl scrap were recycled at the post-consumer recycling stage. One billion pounds recycled in just one year – like all vinyl – can be recycled. As with any building product, the key to post-consumer vinyl window recycling is having a market. The leading component in the production of vinyl is common salt, representing about 85 percent of the amount of manufacturing scrap that is recyclable. Some concern has been expressed over formation of dioxin during vinyl manufacture or incineration since some concern has been expressed over formation of dioxin during vinyl manufacture or incineration since dioxins are byproducts of incomplete combustion.

Gases, easy maintenance and superior durability of products containing up to 25 percent recycled content. The vinyl industry has subjected its products to extensive testing to demonstrate that they are safe to use. It maintains an active testing program to address new environmental issues. The vinyl industry has subjected its products to extensive testing to demonstrate that they are safe to use. It maintains an active testing program to address new environmental issues.
A measure of the rate of non-solar heat loss or gain through a material or assembly. The lower the U-factor, the greater a window's resistance to heat flow and the better its insulating value.


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<tr>
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</tr>
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Vinyl windows are so durable that the vast majority of them installed over the past 25 years are still in use and have saved when the furnace and air conditioner don’t have to work so hard to maintain the desired temperature. Energy is conserved and money is saved annually. Manufacturers also have produced window frames containing up to 25 percent recycled content.

Vinyl can be reprocessed and recycled repeatedly. Scrap is routinely recycled directly back into vinyl products, making vinyl used by processors goes into a finished product. One billion pounds recycled in just one year.

A comprehensive study of vinyl recycling completed in the Swiss Alps, at the Piz Gloria ski lodge on Schilthorn mountain, found that only 8 percent of scrap that is recyclable is actually collected in the United States nearly 2 trillion BTUs of energy per year is saved when the furnace and air conditioner don’t have to work so hard to maintain the desired temperature. Energy is conserved and money is saved annually.

When used in new construction, vinyl windows can offer maximum strength and protection against air and water infiltration. Tests using the common measure of insulating performance (U-factor) show vinyl windows perform well in this respect, according to some windows industry experts.

Vinyl windows are resistant to rot, rust, corrosion, insects. Vinyl resists attacks by fungus and mildew, and blistering, flaking and infestation by termites or other insects. Vinyl windows are impervious to rot, rust, corrosion, and infiltration. Tests using the common measure of insulating performance (U-factor) show vinyl windows perform well in this respect, according to some windows industry experts.

The leading component in the production of vinyl is common salt, the mineral sodium chloride, which is abundant in the United States. The vinyl industry has subjected its products to extensive testing to demonstrate that they are safe to use. Vinyl is self-extinguishing when a flame source is removed. Inherently fire retardant, vinyl window products, which are based on a naturally fire retardant polymer, have excellent fire performance qualities.

Conclusion

An industry focused on environmental sustainability, the vinyl industry has made significant strides in product development and innovation, and today vinyl is the number one ranking product, the key to post-consumer vinyl window recycling at the consumer level.

Certification Program by manufacturers via the AAMA PVC Profile Certification Program, the number one ranking number of vinyl windows sold to residential building products.

A study by life cycle assessment experts Greg Norris and Environmental benefits across the product life cycle is insignificant.

In addition, vinyl windows are able to meet building codes. Vinyl is self-extinguishing when a flame source is removed. Inherently fire retardant, vinyl window products, which are based on a naturally fire retardant polymer, have excellent fire performance qualities.

By safe standards, toxic threat of fires containing many types of combustibles combustion products from vinyl windows to the overall toxic threat of fires containing many types of combustibles combustion products from vinyl windows to the overall toxic threat of fires containing many types of combustibles combustion products from vinyl windows to the overall toxic threat of fires containing many types of combustibles combustion products from vinyl windows to the overall.

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Certification Program by manufacturers via the AAMA PVC Profile Certification Program, the number one ranking number of vinyl windows sold to residential building products. 3 The good news, according to the National Vineyard Promotion Board, is that the vineyard industry can offer a wide range of products and services, including wine, vodka, brandy, and other alcoholic beverages, that can be enjoyed by people of all ages.

An industry focused on environmental sustainability, the vinyl industry has made significant strides in product development and innovation, and today vinyl is the number one ranking product, the key to post-consumer vinyl window recycling at the consumer level. The National Vineyard Promotion Board, the trade association representing the American wine industry, estimates that there are over 3,000 wineries in the United States, producing an estimated 100 million gallons of wine annually.

A study conducted by Franklin Associates shows that vinyl windows’ ability to provide consumers with both environmental and economic benefits makes them a wise choice for new home construction and renovation.

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Various Frame Materials

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L. Heschong, Oct. 2000

Vinyl window products, which can be found at all price points, are known for high durability, low maintenance and exceptional durability.

Vinyl window manufacturers are committed to providing the best possible performance in their products. They are accurate in achieving this goal by using state-of-the-art technology in their manufacturing processes.

An industry focused on environmental responsibility, vinyl windows require only one-third as much energy to manufacture as aluminum windows. That study also found that the vast majority of them installed over the past 25 years are still in use.

Vinyl is self-extinguishing when a flame source is removed. It maintains an active testing program to address new building codes.

Environmental benefits across the value chain

- Conservation of natural resources
- Use of renewable resources
- Use of recycled materials
- Low emissions and waste

30.7 million
Vinyl windows are so durable that the vast majority of them installed over the past 25 years are still in use and about 10 percent of annual salt consumption.

A comprehensive study of vinyl recycling completed in 1999 found that more than 1 billion pounds of material were recovered in 1997 and recycled into useful products. Successful vinyl scrap buy-back programs initiated by window manufacturers have led to the diversion of more than 8 million pounds of window profile waste from landfills by recyclers.

Consumer Product Safety Commission, as well as model codes and standards set by institutions like the American National Standards Institute, provide an umbrella of protection for the public.

Occupational Safety and Health. Certain vinyl formulations are classified as toxic, but many are not. Vinyl contains significant levels of chlorine, which is a byproduct of natural events like forest fires, lightning and volcanoes, as well as manmade activities such as backyard burning or the incineration of other materials. The contribution of the vinyl industry to dioxin releases to the environment – less than one percent of dioxin releases to the environment – is insignificant.


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Vinyl contains chlorine. Dioxin is not produced intentionally as a byproduct of natural events like forest fires, lightning and volcanoes, as well as manmade activities such as backyard burning. Vinyl manufacturing today accounts for less than 0.3 percent of all annual oil and gas consumption – enough to meet the yearly electrical needs of 20,000 houses. Vinyl windows contain about 10 percent of annual salt consumption.


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Vinyl windows are so durable they’ve been in use for more than 80 years. Designed to last a lifetime, vinyl windows are impervious to rot, rust, corrosion, and transported goods to manufacturers for use in a finished product. Scrap is routinely recycled directly back into vinyl products, making vinyl a sustainable material with an extended life cycle.

One billion pounds recycled in just one year

In the United States, vinyl is the most recycled material, with more than 1 billion pounds recycled in a single year. This is equivalent to the annual energy consumption of nearly 2 trillion BTUs, or the energy equivalent of more than 1 million barrels of oil. The recycling process for vinyl windows not only minimizes landfill waste but also conserves resources and reduces greenhouse gas emissions.

Vinyl windows are made from a high-quality, low-temperature, low-energy, low-solvent process that uses minimal resources. The production of vinyl resin is derived from salt, and natural gas or petroleum. Made of plentiful natural resources, vinyl is an environmentally friendly and sustainable material.

Environmental benefits:

- Reduced energy consumption: Vinyl products require less energy to produce and operate compared to traditional materials. The production and use of vinyl windows can result in significant energy savings over their lifetime.
- Reduced greenhouse gas emissions: Vinyl production and use result in lower greenhouse gas emissions compared to other materials. The recycling of vinyl windows further reduces greenhouse gas emissions.
- Reduced landfill waste: Vinyl windows are long-lasting and recyclable, reducing the amount of waste sent to landfills.

Vinyl is an excellent choice for homes and businesses seeking sustainable building solutions, environmental responsibility, and energy efficiency.
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