

An Overview of a shifting market



Know the Beauty of Innovation

2010

During recent years, environmental concerns have contributed to the innovation of sustainable building materials. The environmental movement is leading major industry players including consumers towards the appreciation of green building products.

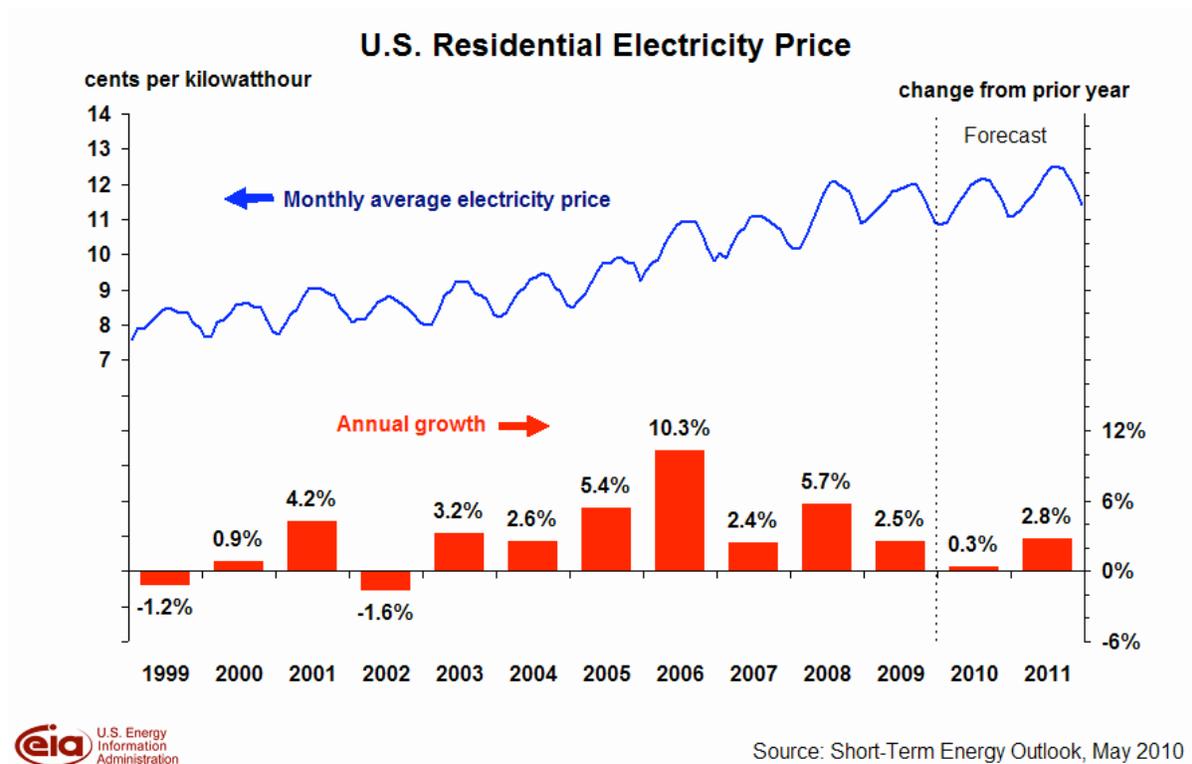
As a leading fiberglass door manufacturer, Plastpro takes all environmental factors in consideration when innovating new products. The purpose of this paper is to provide an overview of the current market trend and the role of fiberglass entry doors in sustainable building design while comparing features and benefits of different entry door materials.



Market trend in the green building industry

Manufacturers of green building materials experience a significant increase in demand from distributors and builders on sustainable building products. Simultaneously, environmental awareness and rising energy cost influence consumers' preference when purchasing homes.

Builders and homeowners proactively seek for alternative methods to minimize the cost and increase the value of building and owning sustainable homes. When looking at the chart below, it is apparent that the price for residential electricity is on steady rise.



In 2008, American Institute of Architects and AutoDesk, Inc conducted a study which revealed a significant increase in the popularity of sustainable design practice among architects and builders. Architects in particular, expressed motivation and encouragement towards designing sustainable homes.

Market Research Findings

A McGraw Hill Construction research findings in 2009 demonstrated that 70% of companies recognize performance benefit as a main green feature.

By offering green products, businesses are able to provide benefits such as the following:

- **Saving resources**
- **Energy efficiency**
- **Improved health**
- **Reduced carbon footprint**



These performance benefits are valuable aspects to the end customers as well, which takes us to the 2009 consumer online survey by Opinion Research Corporation.

The survey indicates 68% of Americans actively seek opportunities to buy environmentally friendly products share the following shopping characteristics:

- **Less price sensitive than the average shopper**
- **View green as a differentiator when choosing between products**
- **Demonstrate brand loyalty**

Unlike price sensitive consumers, the decision making factors among green consumers rely heavily on the quality and value of a product they consider to purchase. The return financial and environmental advantages of sustainable buildings are by far higher than traditional ones and therefore more attractive to green consumers..

Characteristics of Fiberglass Doors

The focus of this paper is to enlighten the values of fiberglass doors in comparison to other entry door materials in terms of sustainability and durability. Fiberglass doors offer many benefits.

- **Durability**- Fiberglass doors can with stand extreme weather conditions without cracking, splitting, rotting or warping.
- **Saving more trees**- Because of its durability, less wood door needs to be used and more trees are being saved.
- **Energy efficiency**- Fiberglass doors are filled with polyurethane foam that makes the door up to 5 times more energy efficient than wood doors.
- **Warranty**- Unlike wood doors, most fiberglass doors come with warranty.
- **Tax Credit**- Most fiberglass doors qualify for Tax Credit.

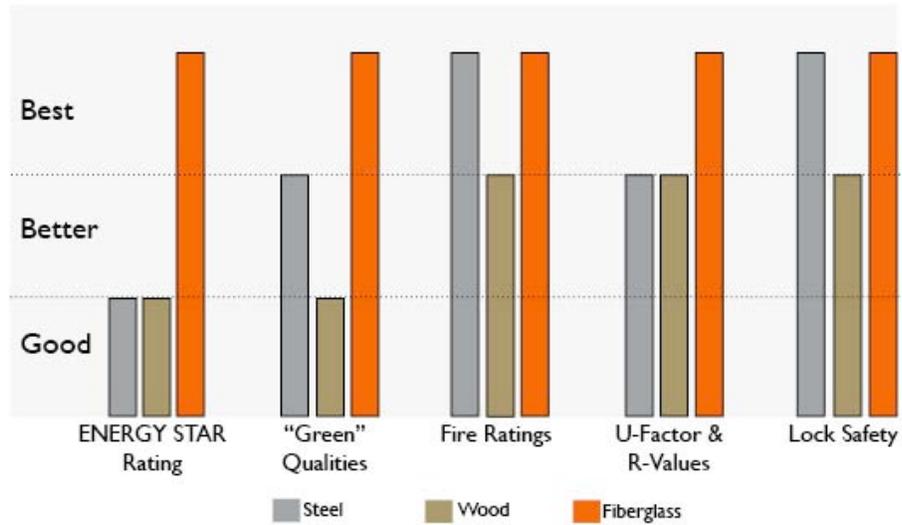
Comparing Wood, Steel and Fiberglass

A properly installed fiberglass entry system has higher safety rate and energy efficiency while providing lower energy cost. Compared to the available alternatives such as steel and wood, fiberglass doors offer greater advantages as mentioned above. Although in some cases, steel and fiberglass doors seem to have similar attributes, cross comparison on benefits and features shows that fiberglass doors demonstrate greater overall performance in multiple areas.

Environment and Safety

When comparing environment and safety levels between the three choices, we will find that fiberglass doors that are ENERGY STAR qualified contain more recyclable materials and have higher U-factor and R-value than steel and wood. The fire rating and lock safety level is about the same for steel and fiberglass, while wood has the least.

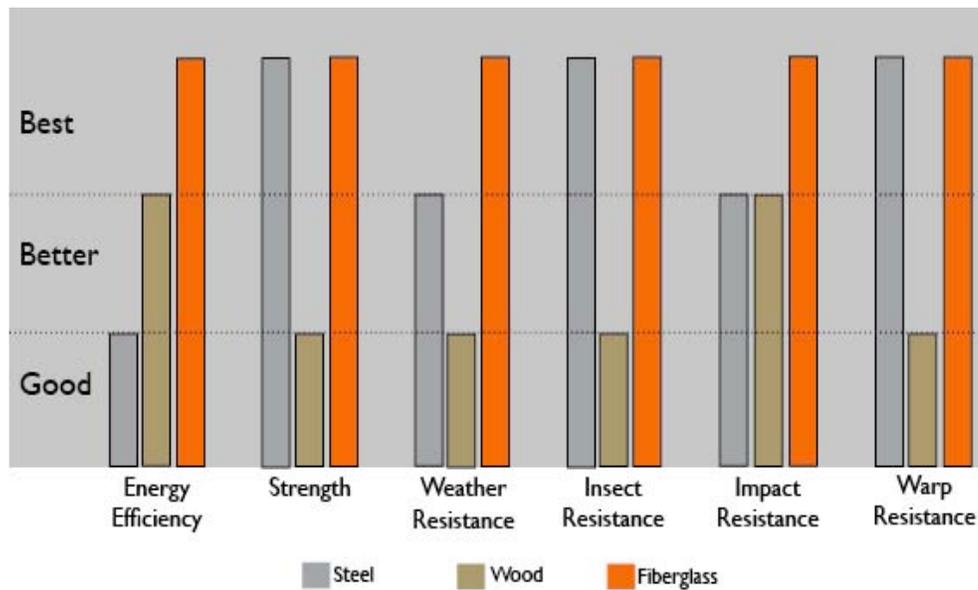
Appendix A



Performance

Wood doors are known for wide range of design options and beauty while fiberglass doors are known for energy efficiency. Fiberglass doors are typically more energy efficient because they are excellent insulators. Since fiberglass doors and frames do not require as much maintenance and are not vulnerable to various weather conditions or impacts and therefore won't rot, warp, dent or rust. Fiberglass doors are also available in impact resistant materials.

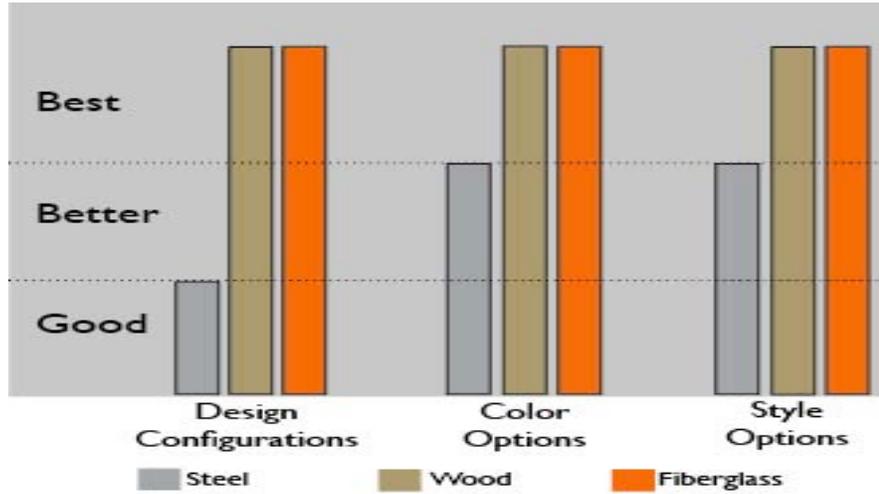
Appendix B



Aesthetics

The aesthetic options for door materials such as steel are usually very limited as they can only be painted. Wood and fiberglass doors on the other hand, offer virtually unlimited design options to suit many style preferences. Both wood and fiberglass are easily machined and come in countless amounts of customized panel profile configurations. Wood and fiberglass can also be painted or stained, providing unlimited color and finish options.

Appendix C



Composite Frames

When selecting a fiberglass entry door, it is strongly recommended to pre-hang the door in frames of similar or same material. Some fiberglass doors are hung in composite frames to maximize the strength, performance, durability and safety of the entire door unit. Unlike wood frames, composite PF-frames accommodate the fiberglass door with the same quality assurance.

Appendix 1-4.



Differentiator factors between fiberglass doors

Despite the benefits, there are few valuable points to consider before selecting a door. Almost all fiberglass doors share similar attributes and appearance; however, depending on the material used to build the door, such as the stiles, rails and the core foam formulation, the quality will vary.

Unfortunately, most fiberglass door manufacturers use stiles and rails made of wood which defeats the purpose of fiberglass doors. For instance, if the rails and stiles are made of wood, eventually water will penetrate and cause the stiles and rails to rot and split. Most of all, it's wood!

Composite stiles and rails on the other hand protect the door from humidity and moisture. (Please refer to appendix 1, 2 and 3 for visual demonstration) For a durable and reliable fiberglass door, consider the following when choosing the *perfect* entry system for your project.

- Composite Stiles and Rails
- Reinforced Lock block
- Composite PF-frames
- Qualify for Tax Credit
- Energy Efficient rating

Environmental Commitments and Practices

Plastpro is dedicated to contribute to the growth of sustainable buildings developments. As part of the ongoing commitment to green practices and to meet government's regional energy efficiency and conservation standards, Plastpro is in partnership with several reputable organizations. In addition, Plastpro is actively involved in humanitarian projects to help improve families with financial constrains.

- **Built Green Association**
- **United States Government's Energy Star program**
- **US Green Building Council**
- **WDMA**
- **NFRC**

Plastpro Product Quality Advantages

- All products are fabricated with Plastpro exclusive Hydroshield Technology™ and built with closed cell technology to provide superior protection and resist deterioration as a result of moisture, humidity level and temperature changes.
- Rigid Poly-fiber formulation- for maximum durability, support and reliable strength Plastpro integrates Rigid Poly-fiber, which eliminates the need for an aluminum support channel.
- Plastpro is the only fiberglass manufacturer building full-length composite stiles and rails all around.
- PF Frame- Plastpro PF-Frame is made of PVC and 100% wood waste (wood flour).
- Plastpro is the only company that offers full-length composite frames to achieve maximum strength. Other companies may use a few inches of composite material finger jointed to wood at the bottom of their frame



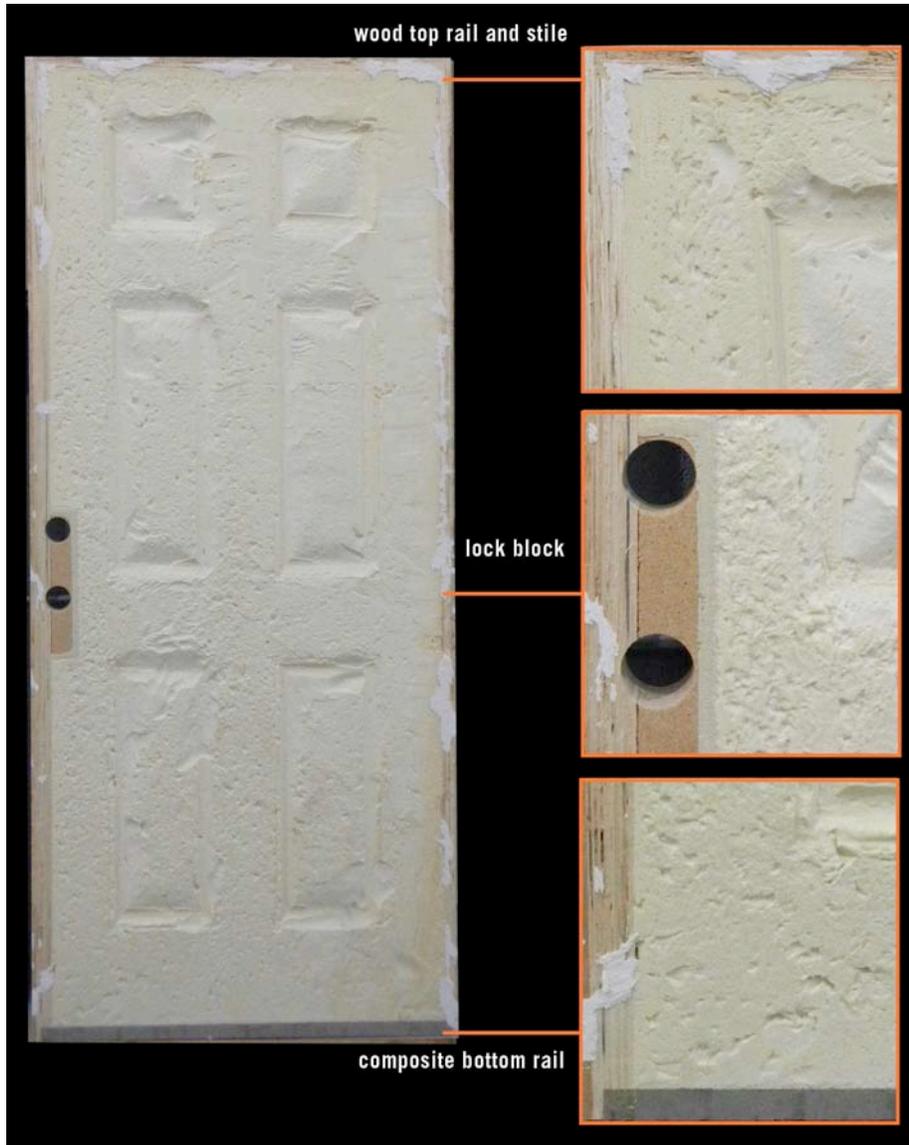
Appendix 1

This is an example of a fiberglass door, where the top and bottom rails and stiles are made of wood. Using wood instead of composite material will not protect the fiberglass door against humidity and moist. Eventually, the wood stile and rail will absorb water and the door will need to be replaced



Appendix 2

This example below provides composite bottom rail while the stiles and top rail is entirely made of wood. The composite bottom rail stops the moist from entering but allows water to penetrate from the stiles which will cause damage to the door. Most of the strength comes from the polyurethane foam that is injected into the door. Air holes present inside the door leads to less durability.



Appendix 3

This model illustrates a fiberglass door with composite stiles and composite bottom rail. The top rail, however, is made of wood which leaves room for water to cause damage. The uneven surface results in density inconsistency and cause the skin to easily be peeled off.



Appendix 4

This last example of fiberglass door illustrates one that is made of wood rails and stiles all around the door. The door is a combination of steel wood and foam. The all around wood rails and stiles allow water and moist to enter and damage the door similar to the other doors mentioned above..



Resources

<http://www.aia.org/press/AIAB080964>

<http://www.buildinggreen.com>

<http://www.buildinggreen.com/auth/article.cfm/2000/1/1/Building-Materials-What-Makes-a-Product-Green>

<http://www.coneinc.com/news/request.php?id=2030>

http://www.greenspacencr.org/building/pros/why_b/economic_sense_b.html

<http://www.wisegeek.com/what-are-the-advantages-of-fiberglass-doors.htm>

<http://www.eia.doe.gov/>