



Window Materials Guide

An E-book series from Quality Window & Door

Window Guide:

Choosing the Best Windows for Your Home

If you're in the market for new windows, you may be overwhelmed by the selection you have for your replacement products. From style and shape to material and finishing colors, the choices are endless. Luckily, you've landed on the window guide that will tell you everything you need to know about different window materials. Here, you'll learn more about the advantages of each and insight into how they are made. Also, look for our key that indicates how each compares in terms of energy efficiency, durability, price, and more!



Energy Efficiency: Very Good
Price: High
Maintenance: High
Durability: Fair
Strength: Good
Color Selection: Very Good



Wood Windows

Wood windows have been used for centuries and despite the coming of metals and synthetics, wood remains the traditionalist's choice. Wood windows deliver exceptional thermal performance due to their inherent insulating qualities. Warmth and the natural beauty of wood make this material a popular choice. Historic neighborhoods often require replacement wood windows that closely resemble the old style window being replaced. Many architects prefer wood products to maintain the look and feel of traditional architecture. Wood windows with state-of-the-art insulated glass, weather stripping and operating hardware are a vast improvement over drafty, poorly operating windows found in older homes.

Unfortunately, quality wood windows are among the higher priced products on the market. If you are selecting wood replacement windows, be sure to choose a reputable manufacturer that uses preservative treated wood in the construction of their products. All lumber should be treated after it is cut to ensure long lasting beauty and performance. Quality primer, finish coats, and caulk should be used to ensure that your windows will stand up against the elements. Yearly inspections should be done on all exterior surfaces and caulk joints to ensure years of long lasting beauty and trouble-free operation.



Energy Efficiency: Very Good

Price: High

Maintenance: High

Durability: Fair

Strength: Good

Color Selection: Very Good



Wood Clad Windows

Wood clad windows should be considered if wood windows are desired but maintenance is a major concern. Cladding is typically an aluminum or vinyl protective cover that shields the wood exterior from weather but leaves the natural wood exposed on the inside. There are three types of wood clad windows to consider.

Extruded Aluminum Clad Windows

Extruded aluminum clad windows use a very durable cladding in the manufacturing process. The aluminum is extruded by pushing it through a die and forming one piece of shaped metal. This piece of aluminum is typically the thickness of a quarter. The factory paint finish is then evenly applied to the entire extrusion. It is then attached and sealed to the wood window sash and frame. In many manufacturing processes, this becomes an integral part of the window and adds structural strength to the frame and sash.

What Are Clad Windows?

A wood clad window has a protective exterior cover, usually made of aluminum or vinyl, with a wood interior. Clad windows have a low-maintenance exterior that better stands up to changing temperatures and moisture while still keeping a beautiful wood interior.



Energy Efficiency: Very Good
Price: High
Maintenance: Very Good
Durability: Very Good
Strength: Very Good
Color Selection: Very Good

Roll Formed Aluminum Clad Windows

Roll formed aluminum clad windows use a very different process. Roll formed aluminum is processed or rolled into a thin aluminum sheet, and then paint is applied to this entire sheet. It is cut, then bent and wrapped around a sash or frame. It typically is the thickness of a soda can. It can be prone to denting and usually does not improve the structural strength of the window. Some manufacturers use a combination of a roll formed sash with an extruded aluminum frame. Window and siding contractors use roll formed aluminum or coil stock to cover exterior trim to make it maintenance-free. Roofers use it for flashing material.



Energy Efficiency: Very Good

Price: High

Maintenance: Very Good

Durability: Good

Strength: Good

Color Selection: Very Good

Vinyl Clad Windows

Vinyl clad windows use a combination of vinyl and wood. The vinyl is extruded and attached to the sash and frame. Some manufacturers use vinyl covered frames with painted wood sashes. Other manufacturers make a complete vinyl window and laminate the interior with thin layers of wood. Typically, vinyl clad windows are the least durable because vinyl has no inherent strength and over time is broken down by the sun's rays. Vinyl's low thermal conduction properties may provide a slightly higher energy efficiency rating over aluminum.



Energy Efficiency: Very Good

Price: High

Maintenance: Very Good

Durability: Good

Strength: Good

Color Selection: Average

Vinyl Windows

It wasn't too long ago that vinyl was considered a less than ideal choice for window replacement. Vinyl is a petroleum based product that is adversely affected by the sun's ultraviolet rays. However, advances in design, plus improvements in formulations of vinyl, have greatly improved the quality of the product and now are a viable alternative to wood windows. Vinyl's low thermal conduction properties make it nearly ideal for use in windows. Like aluminum windows, vinyl is extruded, but because it is not rigid, several internal hollow chambers are often added to provide strength. These chambers also trap air, increasing the energy performance and improving the sound muffling qualities of the window. Overall, the thicker the vinyl and more internal chambers, the stronger and more energy efficient the vinyl window will be. The design of the extrusion is critical to the energy performance and structural strength of the product.



Energy Efficiency: Very Good

Price: Moderate

Maintenance: Very Good

Durability: Good

Strength: Average

Color Selection: Average

A Note About the Type of Vinyl Used

Not all vinyl windows are created equal. The type of vinyl used in the window has a direct effect on the performance and longevity of the product. Vinyl windows are made out of a compound known as PVC (polyvinyl chloride). PVC can be difficult to extrude or push through dies that form the parts and pieces for the window. In order to aid in the extrusion process, plasticizers are added to make the compound more pliable. While plasticizers aid in the extrusion process, they have some adverse side effects as well. Plasticizers can make the vinyl very dense and brittle, making the window susceptible to cracking and twisting when exposed to ultraviolet rays. The development of uPVC or unplasticized-polyvinyl chloride has greatly improved the manufacturing process. With this compound, no plasticizers are added. Instead, other additives are mixed with the compound to provide protection from weathering, impact strength, and aid in the extrusion process of the material. The final product is stronger, longer lasting, and will fight the effects of ultraviolet rays.



Aluminum Windows

Aluminum windows were very popular when energy prices were not a concern. Today, aluminum windows are used more in commercial buildings because of their structural strength, which allows very large glass sizes to be used. Design of the aluminum extrusion is critical to energy performance and the structural and operational characteristics of the product. Aluminum can be manufactured to very close tolerances. This, along with the durability and strength, can insure that an aluminum window will provide many years of reliable operation.

Aluminum is a very good conductor of heat (1000 times more than wood and vinyl) and cold. However, they can be designed with a much smaller profile than wood or vinyl. This can minimize heat frame loss and yield a larger glass vision area.

Thermally improved aluminum windows can deliver strength and durability of solid aluminum but with a reduction in heat loss through the frame. A standard aluminum frame will allow heat to travel freely from the warm inner side of the frame to the cold exterior side. This heat loss can be reduced by a thermal break which separates or splits the inside frame from the outside frame with non-conductive material. A thermal break can substantially improve the window performance.



Energy Efficiency: Average

Price: Moderate

Maintenance: Very Good

Durability: Very Good

Strength: Very Good

Color Selection: Very Good

Fiberglass Windows

Fiberglass windows are relatively new to the market and can provide a combination of benefits—making them a great choice for your home. Fiberglass is structurally strong, expands and contracts very little with the temperature changes, and is a good insulator. Fiberglass frames are much stronger than vinyl and, therefore, can be made with a lower profile like aluminum but with better thermal efficiency. Several varieties of fiberglass windows have recently become available as some manufacturers have entered the composite market. They combine a wood interior with a composite exterior. Rather than providing a fiberglass cladding over wood, the main frame is all fiberglass, providing structural strength and the finished exterior of the window. Typically today, fiberglass windows have been priced above vinyl and equal to the cost of high-end wood windows. As more new window products come on the market today, the issue of availability and price will determine which segment of the housing market will accept or demand fiberglass products.



Energy Efficiency: Very Good

Price: High

Maintenance: Very Good

Durability: Very Good

Strength: Very Good

Color Selection: Very Good

Composite Windows

Any of the frame material types mentioned above may be combined to make hybrid windows. For instance, interior wood strips are sometimes attached to an aluminum frame to combine the exterior weathering, strength, and weight properties of aluminum with a natural wood interior finish. Although these products own a very small share of the current market, new products combining vinyl with fiberglass, wood, or other materials are appearing as manufacturing processes evolve and improve.



Energy Efficiency: Very Good

Price: High

Maintenance: Very Good

Durability: Very Good

Strength: Very Good

Color Selection: Good

Window Material Comparison

Use this comparison table for a quick look at the advantages and qualities of different window materials.

	ENERGY EFFICIENCY	PRICE	MAINTENANCE	DURABILITY	STRENGTH	COLOR SELECTION
WOOD	Very Good	High	High	Fair	Good	Very Good
ALUMINUM CLAD (EXTRUDED)	Very Good	High	Very Good	Very Good	Very Good	Very Good
ALUMINUM CLAD (ROLL FORMED)	Very Good	High	Very Good	Good	Good	Very Good
VINYL CLAD	Very Good	High	Very Good	Good	Good	Average
VINYL	Very Good	Moderate	Very Good	Good	Average	Average
ALUMINUM	Average	Moderate	Very Good	Very Good	Very Good	Good
FIBERGLASS	Very Good	High	Very Good	Very Good	Very Good	Very Good
COMPOSITE	Very Good	High	Very Good	Very Good	Very Good	Good

Have more questions or not sure what's best for your home? Contact the experts at Quality Window & Door! Call **800.657.1373** to schedule a free consultation or visit www.qualitywindowanddoorinc.com.

About Quality Window & Door

The Replacement Window Experts in Washington, DC, Maryland & Virginia

Our vision began with the company's owner and president, Bob Neidig (photo and quote box), who founded Quality Window & Door in 1989 on the idea that every customer should love the finished product for years to come.

The desire to consistently deliver an unparalleled customer experience is the foundation of our company, and we look forward to extending our award-winning services to every customer we meet and work with. We carry a wide selection of top-quality products from manufacturers you know and trust.

Our motto is to always put yourself in the customers shoes and do everything like you were working on your own home – providing a first class experience when working with our company.

New and replacement windows, we've got it all. No matter what style, material, or design, our expert team will educate you on all the options available and recommend products that match your preferences. We want you to be more than satisfied with your new windows.

Quality Window & Door works with many window manufacturers to offer our customers a wide selection of the best windows on the market. One of our top partners is Weather Shield—window products featured in this E-book are from Weather Shield's selection of high quality, beautiful windows.



“Whether you are a homeowner, architect, or contractor, I believe you will find our approach unique. Our sales and marketing philosophy revolves around providing an educative approach to offering a non-proprietary distribution from multiple brands of windows and doors. The more you know about windows and doors, the more likely you are to buy them from Quality Window & Door.”

– Bob Neidig, President





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