

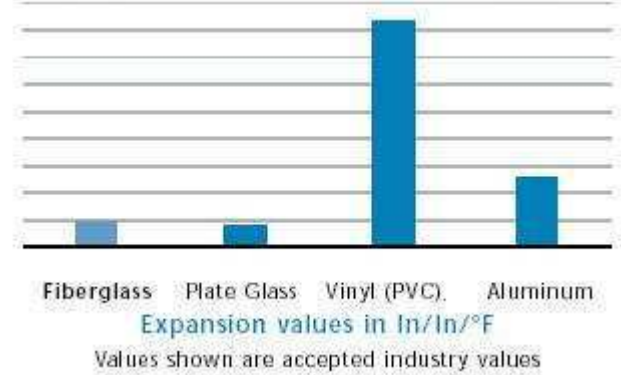


[Benefits and Features](#) • [Fiberglass Applications](#) • [Pultrusion History](#) • [Environmental Benefits](#) • [Pultruded Fiberglass](#)

Fiberglass is a natural insulator because it does not conduct heat and cold, and it doesn't expand or contract. Most window and door frame components have an interface of different materials: glass on wood, glass on aluminum or glass on vinyl. With fiberglass, the components are identical which means there is minimal expansion and contraction and if there is any, the components expand and contract as a unit.

PULTRUDED FIBERGLASS IS AN EXTRAORDINARY MATERIAL WITH SUPERIOR PERFORMANCE CHARACTERISTICS WITH THE FOLLOWING RECOGNIZED MATERIAL ADVANTAGES:

EXPANSION / CONTRACTION COMPARISON



STRENGTH – A well engineered FG window delivers vastly superior strength characteristics when compared to other windows like PVC FG provides 8 times greater sheer strength when compared to PVC.

LOW MAINTENANCE – FG is the most stable material which provides an ideal base for a full range of finishes, ensuring an unbelievably durable window. This material is so tough that it will withstand extremes from Arctic cold to blazing desert

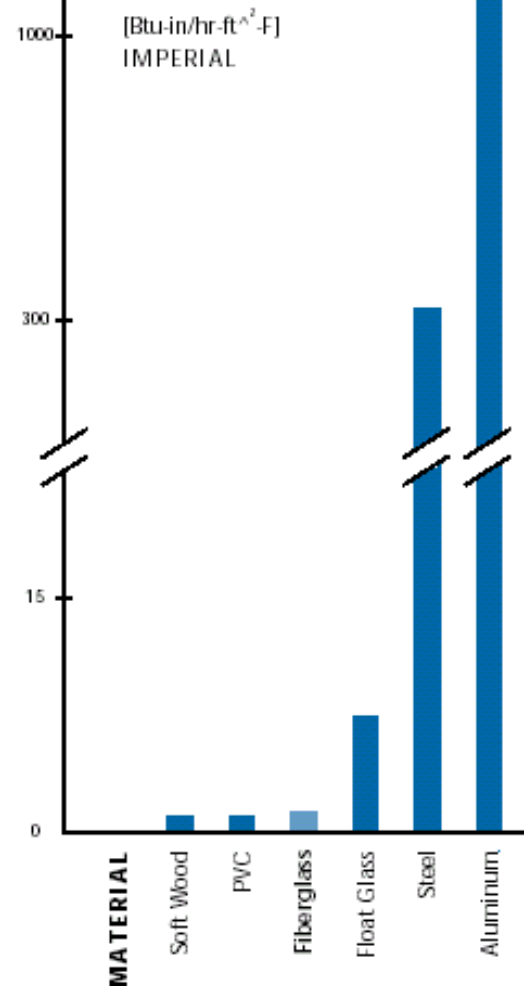
heat to the rugged seacoast!

CONDUCTIVITY – FG combines strength with very low levels of conductivity, without adding thermal breaks. FG is an amazing 500 times less conductive than aluminum and FG frames and sash are also less conductive than vinyl due to reduced mass.

ENVIRONMENTALLY FRIENDLY – FG not only features the lowest embodied energy (low energy consumption in lineal production) when compared to other common window frame materials while providing and the longest life expectancy. This has led experts to recognize FG as the most environmentally friendly system.

NON-CORRODING – FG material is used in boats and bridge structures which face punishing loads and stresses as well as corrosive

CONDUCTIVITY COMPARISON





materials such as salt water. FG window frames provide superior life and durability to vinyl and aluminum in corrosive/coastal environments.

[Benefits and Features](#) • [Fiberglass Applications](#) • [Pultrusion History](#) • [Environmental Benefits](#) • [Pultruded Fiberglass](#)

From glass marbles to fiber optics. - What is really exciting about Fiberglass window products is - the more you know about Fiberglass products in general, the more you will exude that comfort level to your customers. Once you realize how many products are being replaced with engineered Fiberglass composites, you get the feeling that this is the material of choice - no matter what the application.

The following is a list of common products that you are familiar with:

Transportation: Automotive bodies and Bumpers, from the luster finished sleek performance sports car, to large utility construction equipment, Truck Beds and even armored vehicles, that are constantly exposed to the extremes of climate and subjected to abuse.

Air Craft: The high strength to weight ratio of Fiberglass, is ideal for plane fuselage, propellers and nose cones of high performance jets.

Boats: Once completely dominated by wood and aluminum are now 95% dominated by Fiberglass, due to its ability to withstand the elements under heat and cold, it's resistance to corrosion, both salt water and atmospheric pollution, yet retain the beauty of it's finish with minimal maintenance.

Recreation: Little Boys and Big Boy Toys that take a beating, under all temperatures include golf clubs and carts, snow mobiles, hockey sticks, playground equipment, skis and ski poles, fishing rods, travel trailers, that would have a much shorter life if made from any other material.

Construction: Fiberglass is being used to build bridges - "H" and "I" beams and decking. Steel rebar is being replaced with fiberglass, which has the strength of steel, but resists corrosion. Suspension Bridges, for spans so wide that if made with steel, they would collapse under their own weight. Fiberglass guard rails which have proven to be stronger than their steel counterparts. Hydro transmission towers, to street light poles, to Street Manhole covers, due to their strength and lightweight and durability.

Household fixtures: Include items you have taken for granted without thinking, what they are made of. Include shower stalls, laundry tubs, hot tubs, ladders to fiber optic cables.

Environment: In North America every local Gas Station was required by law to dig up their Steel Storage Gas Tanks and replace with Fiberglass, as the material least likely to corrode rot disintegrate and leak it's contents. For the same reason the storage of toxic chemicals is stored in a fiberglass container.



[Benefits and Features](#) • [Fiberglass Applications](#) • [Pultrusion History](#) • [Environmental Benefits](#) • [Pultruded Fiberglass](#)

Fiberglass Pultruded Profiles are not new. The first patents for pultrusions were issued in 1946. Since then, INLINE FIBERGLASS has been granted International Patents related to the Fiberglass Pultrusion and the Fabrication and Assembly of Fiberglass Fenestration Products.

The entry of Fiberglass into the fenestration Industry (doors and windows), came about with the ability to maximize the Glass Content. The high glass content and polymer matrix increased the physical properties, including strength. With higher glass content, engineers and designers are able to thin down the wall thickness (as low as 0.07") while still maintaining designed strength.

Design potentials are limited only by the requirement that the shape be constant over the length of the profile. The high glass content improved many of the properties by stabilizing the resins. Lineal Profiles of intricate shapes are achieved with a new inert material with tight tolerances and mechanical properties rivaling metal.

[Benefits and Features](#) • [Fiberglass Applications](#) • [Pultrusion History](#) • [Environmental Benefits](#) • [Pultruded Fiberglass](#)

Inline's technological advances extend far beyond simply making products with superior physical characteristics such as strength, design flexibility and stability. The company's products and technology are also rapidly becoming recognized as those with a minimal impact on our environment in terms of the low embodied energy incorporated in its manufacture further enhanced by innate long-term durability and stability. Couple this with the tremendous energy savings and you wish with a material that satisfies the ever more important demand that today's products not only be the best choice for the job but also the best choice for the planet.



Clearsphere

Project: Clearsphere is an eco-friendly, ultra energy efficient home incorporating the latest green technologies and products.

Architect: Clearsphere

Contractor: Alpha-Tec Consulting and Construction

Location: Richmond Hill, ON



Healthy House

Project: CMHC Sponsored Healthy House

Architect: Martin Leifhebber

Contractor: Creative Communities Research Inc.

Location: Toronto, ON

Harmony Dawn Retreat

Project: Sustainable energy technology, green building design and products

Architect: Carolyn Moss/ Moss Design

Contractor: Owner

Location: Alnwick, ON (on Rice Lake)

Green Design and building practices lead to Fiberglass Windows and Door products as the "Natural choice" for "less" energy consumption, "less" environmental impact and desired long term benefits of sustainable building.

[Benefits and Features](#) • [Fiberglass Applications](#) • [Pultrusion History](#) • [Environmental Benefits](#) • [Pultruded Fiberglass](#)

Pultrusion is a fabrication process to produce lineal profiles, that brings high performance Space-Age Composites within the reach of Window and Door Manufacturers.

Continuous fiberglass reinforcements, in roving and mat forms, are drawn through a resin impregnation station to coat each fiber with a specially formulated Thermosetting Resin mixture. The coated fibers are assembled by forming-shaping guide and drawn (pulled) through a die, where under pressure and heat the resins are cured. The result is a high strength profile, ready for use as it leaves the Pultrusion Machine. The process is irreversible, it can not be melted or reformed, unlike PVC, which under heat, will deform.

The resin used in Fiberglass Pultrusions is Thermoset vs. PVC (vinyl) which use Thermoplastic Resins. In the pultrusion process, under heat and pressure, the Thermoset Resins and Fiberglass form a new inert material that is impervious to temperature. Pultruded Fiberglass physical properties do not change through the full temperature cycle up to 350 F. PVC resins become unstable at 155 F.