



FRP and Pultrusion

As the wiki's report Fibre-reinforced plastic (FRP) (also fibre-reinforced polymer) are composite materials made of a polymer matrix reinforced with fibres. The fibres are usually fibreglass, carbon, or aramid, while the polymer is usually an epoxy, vinylester or polyester thermosetting plastic. FRPs are commonly used in the aerospace, automotive, marine, and construction industries.

The FRP is also called GRP(Glass fiber Reinforced Plastic). The main technique to made FRP products contains pultrusion, pulwinding, filament winding, molded, mandrel wrapping and Hand Lay-up. Because those techniques has their own features, for different products, there is a most resonable technique to made it according to the qaulity and cost.

(Unicomposite's main products by different technique:

Pultrusion: fiberglass rod, tube, channel and other structure profiles with steady profiles, fiberglass windows profile, fiberglass sail battens, decking, panel, grating, column, lighting pole, cross arm, carbon fiber rod, carbon fiber tube

Pulwinding: rod, tube, taper pole, thin wall pipe, high pressure pipe, power pole, heavy load corss arm,

Molded : composite sheet, carbint, gratings, samll accessories, rebar

Mandrel wrapping: tubes, conical poles, telescopic pole, cabon fiber shaft

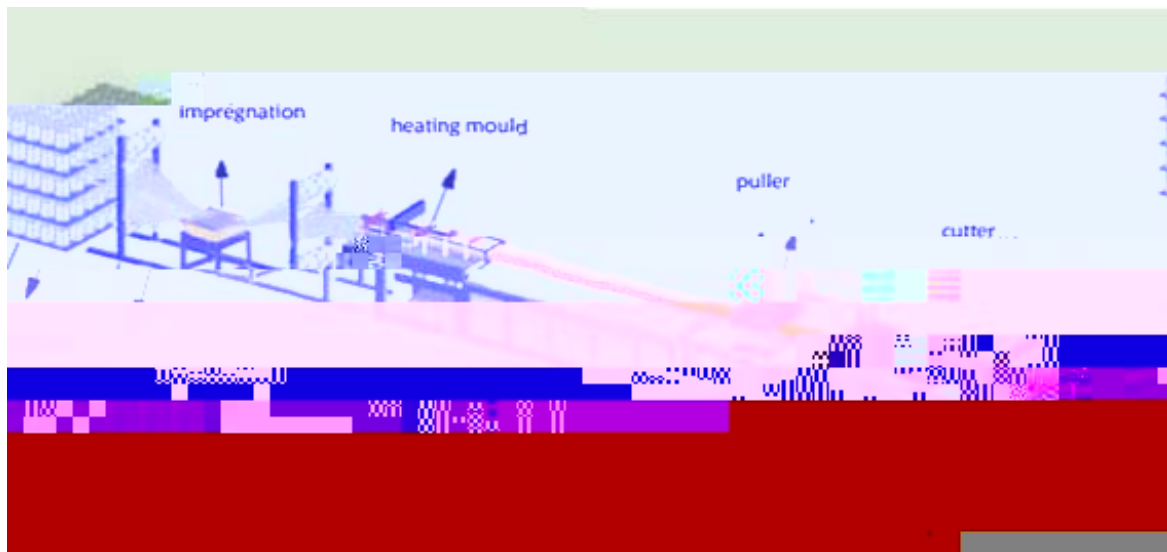
Hand lay-up: large garbage can, garden flowerpot, and other parts)

The technique used most widely is the pultrusion. Pultrusion is a continuous process of manufacturing of composite materials with constant cross-section whereby reinforced fibers are pulled through a resin, possibly followed by a separate preforming system, and into a heated die, where the resin undergoes polymerization. Many resin types may be used in pultrusion including polyester, polyurethane, vinylester and epoxy.

But the technology isn't limited to thermosetting resins. More recently, pultrusion has also been successf psulleyTJ0.000

The advantages of FRP products

- Light Weight
- High Strength
- Durable and Long Service Span.
- Corrosion Resistant.
- Lasting Performance
- Excellent Structural Properties
- Environmentally Safe
- Electrical and Thermal Insulation
- Dimensional Stability



Process of pultrusion

For most application, the material used is polyester and fiberglass. Also the carbon fiber is used for the application which needs more stiffer and strength.

Material: resin, fiberglass roving, fiberglass mat, carbon fiber roving, carbon fiber mesh.



Fiberglass Roving



Fiberglass Mat



Carbon Fiber Cloth

Question and Answer about pultrusion

How is production of samples done?	See the chapter "What is pultrusion?" at this web site
Can GRP profiles processed?	Yes, by the following methods: Grinding Drilling Turning Milling Sawing Water jet cutting Laser Blasting
Can inserts be integrated?	Not during the manufacturing process
Can screws be driven directly into GRP profiles?	There are special screws available which allow direct screwing even into GRP profiles. The design of the screw holes has to be precisely adapted to the type of material. In particular the very little cold-flow of GRP profiles is giving high preference on these materials for direct screwing. These screw-fit is not designed for reversible usage.
Can thermoset parts be connected with rivets?	Yes