

# Environmental Considerations

## Temperature

When designing a structure that is going to incorporate FRP sections, it is essential to consider environment changes such as temperature. Continued exposure to elevated temperatures can cause Polyester and Vinylester Fibreglass pultrusions to lose certain percentage of their properties.

This table shows the percentage of property retention when exposed to certain continuous temperatures.

### Ultimate Stress

Temperature	FR/Polyester	Vinylester
37°C	85%	90%
51°C	70%	80%
65°C	50%	80%
79°C	Not Recommended	75%
93°C	Not Recommended	50%

### Modulus of Elasticity

Temperature	FR/Polyester	Vinylester
37°C	100%	100%
51°C	90%	95%
65°C	85%	90%
79°C	Not Recommended	88%
93°C	Not Recommended	85%



## Weathering

As with most plastic products, fibreglass reinforced pultrusions will undergo some form of visual degradation when exposed to outdoor weathering.

Typically, the surface of ArchitEX™ Pultrusions have good water and ambient temperature resistant properties but are susceptible to ultra-violet (UV) light. UV light is the light spectrum between 290 and 400 nanometres. This light has a higher energy and causes significant degradation to polymers by breaking chemical bonds or starting chemical reactions. The fire retardant polyester formulations contain a halogen which makes these plastics typically more susceptible to UV light degeneration.

Deterioration that has been caused by UV light can be identified by 'fade' and 'yellowing' on the pultrusion surface. Over an extended period of exposure, the actual glass fibres closest to the surface will become exposed. This state is known as fibrebloom and does not directly or immediately affect the physical properties of the section.

Treadwell adds a UV stabiliser into the resin formulation. This is especially important due to our the extreme exposure that our products experience in the Pacific region. Also to ensure that our pultruded products endure a protracted lifespan, we use high quality polyester surface veils to ensure that the structural component of the composite is protected as well as possible from damaging and corroding elements.

The ArchitEX™ range is also offered with a range of exterior coatings to enhance aesthetics. If a Urethane coating is applied, this will also provide a hugely effective protection barrier to outdoor weathering.