



FIBERGLASS REINFORCED PLASTIC (FRP) RESIN SELECTION

TW

TW

TW

TW

# Appropriate Resin Selection



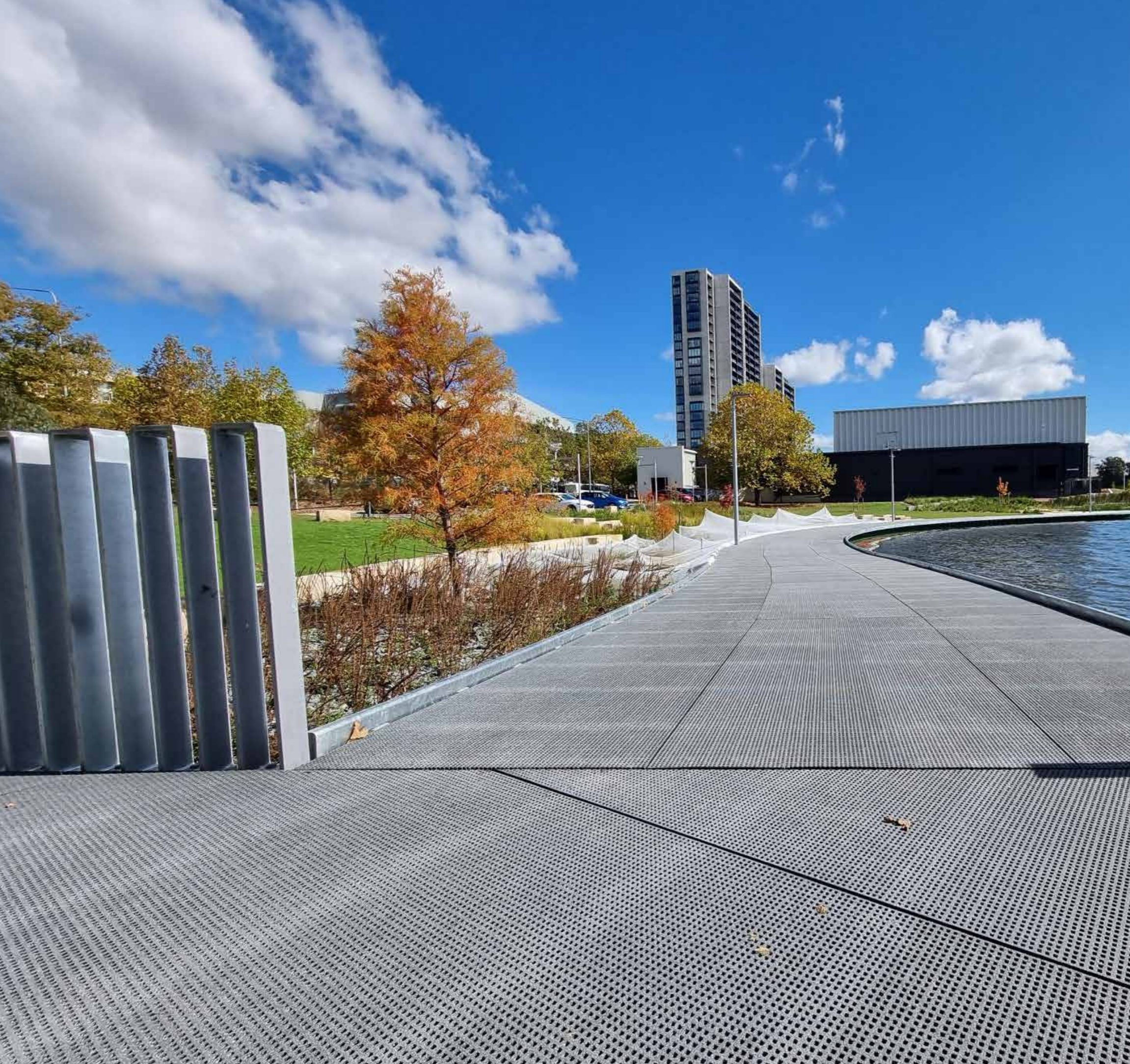
Appropriate resin selection is a critical part of ensuring the performance of any FRP product system. Just like the coating selection for a steel structure, resin selection is wholly dependent on the environment in which the product will be used, with factors such as fire and chemical resistance, amongst others, needing to be considered.

These dictate which resin system should be utilised for optimum performance over time.

Treadwell offers four proprietary resin systems to suit a diverse range of specifications and applications. These resin systems have been developed with Treadwell industry partners, such as, AOC, Ashland, Allnex and Scott Bader to provide the most comprehensive offering in the marketplace.

**Eliminate** the need for a painted surface.  
**Combat corrosion** and achieve *minimal maintenance*.

Treadwell FRP structural sections and grating products are manufactured using glass rovings with a tensile strength of >500,000 PSI. Treadwell FRP products are constructed with integral UV stabilisers and colour pigmentation. These stabilisers limit UV degradation to 0.1%. This, along with integrally formulated pigment means that whilst the surface of the product may fade over the lifetime of the structure, it will do so consistently and without compromising the structural integrity.



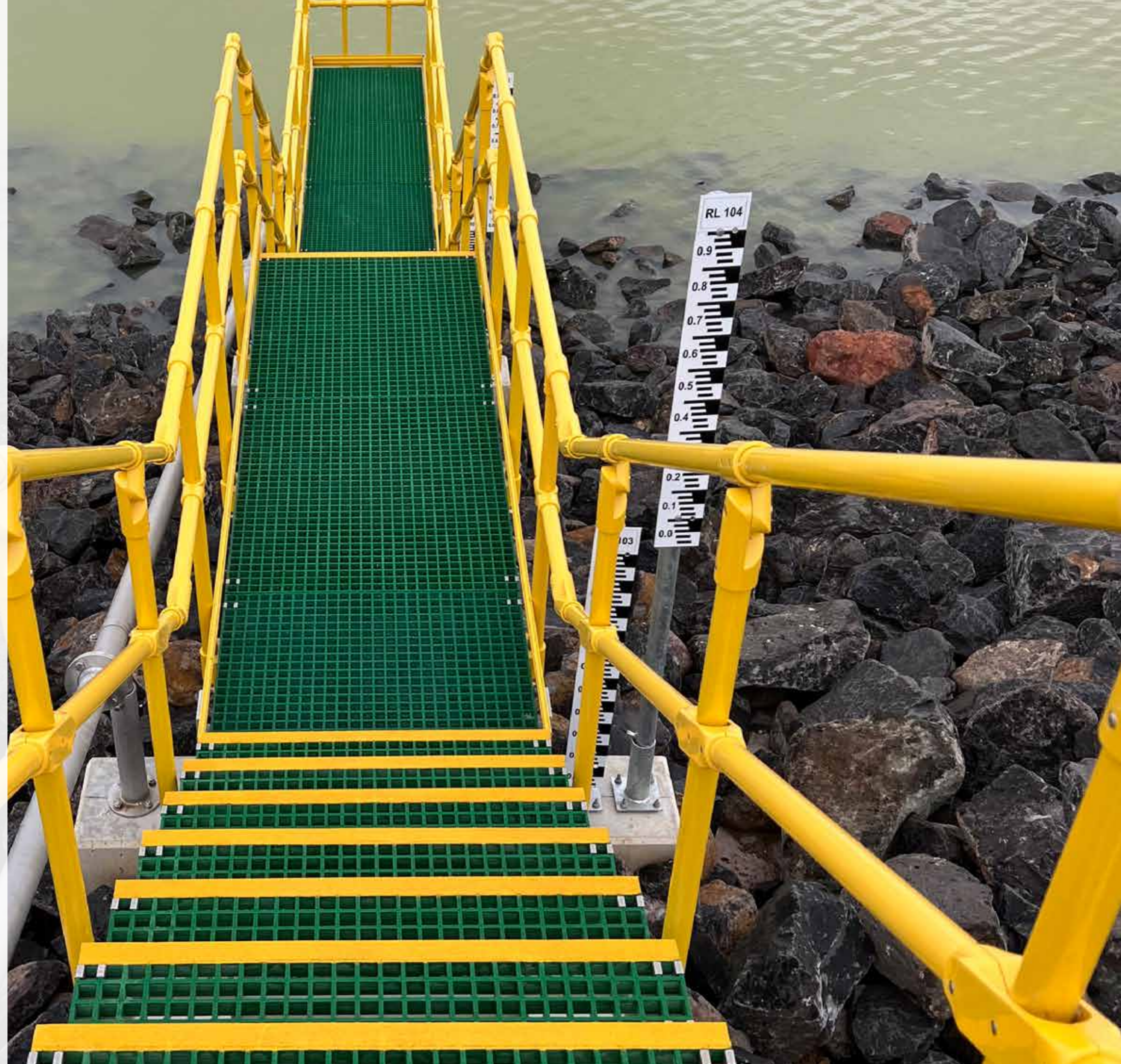
# O-Series® Polyester

An unsaturated thermoset polyester resin, typically specified to replace timber where rot and degradation are concerns. Will not rot or corrode when exposed to salt water or the elements. Fortified with fire retardant additives, UV stabilisers and compliant to AS1530.3 and BCA. Not suitable for pultruded products. O-Series® has an intermediate level of chemical resistance, and is a good choice for residential and light commercial applications, especially where moisture is prevalent. O-Series® is often utilised for applications where it has been proven to outperform traditional timber decking products. This system is only available upon request.

This is commonly used in outdoor recreational structures, for example, in boardwalks and bridges, amongst others, as replacement for timber decking or where the most economical product is desired.

# I-Series® Isophthalic

An unsaturated thermoset polyester resin, will not rust, rot or corrode and suitable for splash or spill exposure to some chemicals. Fire retardants and UV stabilisers are added for AS1530.3 and BCA compliance. Suitable for moulded and pultruded products. Also compliant to AS4020:2018 for use in potable water storage. A premium isophthalic resin system, I-Series® provides an intermediate level of light industrial chemical resistance and is the ideal choice for areas subjected to splash and spill contact with harsh chemicals as well as heavy commercial areas. The I-Series® system is an excellent general purpose resin and is a more favourably priced alternative to the vinylester system. This system has a flame spread of 25 (approximately 15) or less.





## V-Series® Vinylester

A top-of-the-line styrene-modified epoxy resin, providing superior chemical resistance for continuous exposure to acidic and caustic substances, as well as mechanical performance in high heat applications. Typically specified in mining, water and wastewater, and heavy industrial applications. Includes UV stabilisers and fire retardant additives for compliance to AS1530.3 and BCA. Suitable for moulded and pultruded products. V-Series® vinylester provides the highest chemical resistance offered in the industry and has been developed for use in environments where FRP products are subject to frequent and direct contact with the harshest of chemicals, including a broad range of acids and caustics. This system has a flame spread of 25 (approximately 15) or less.

# P-Series® Phenolic

A phenol formaldehyde resin, specified for tunnels and offshore oil and gas applications where superior heat resistance and low smoke toxicity is mandatory. Complies with ASTM F3059-15 Level 2 for US Coast Guard Surface Flammability and Structural Fire Integrity. Suitable for moulded and pultruded products. This particular resin system has a flame spread rating of 5 and a smoke density rating of 5.





Treadwell offers design life and warranty certifications based on the selection of the appropriate resin for the particular application being considered.

In a public infrastructure project, an I-Series® system would be regarded as appropriate for the exposure to the elements and resistant to vandalism such as attempted ignition of the material.

In a wastewater treatment project, V-Series® material would generally be considered the best choice to withstand the hydrogen sulphide attack in this environment.

In summary, Treadwell recommends appropriate resin selections based on application, and prefers to engage in open and transparent discussions with our clients to ensure that a product selected is fit-for-purpose and offers durable and cost-effective performance for the whole of its lifecycle.



## EX-Series® Resin Systems Comparison Chart

Resin Type	Chemical Resistance	Fire Resistance	Fire Retardant	Low Smoke	Halogen Free	Temperature Performance	Non-Conductivity
I-Series® Isophthalic	••	••	•••••	—	—	••	•••••
V-Series® Vinylester	•••••	••	•••••	—	—	•••	•••••
P-Series® Phenolic	••••	•••••	•••••	••••	•••••	•••••	•••••





### Temperature

When designing a structure that is going to incorporate FRP sections, it is essential to consider environmental changes such as temperature. Continued exposure to elevated temperatures can cause polyester and vinylester fibreglass pultrusions to lose certain percentages of their mechanical properties.

These tables shows the percentage of property retention when FRP products are exposed to a range of continuous temperatures.

### Ultimate Stress

Temperature	Polyester	Vinyl Ester
37°C	85%	90%
51°C	70%	80%
65°C	50%	80%
79°C	Not Recommended	75%
93°C	Not Recommended	50%

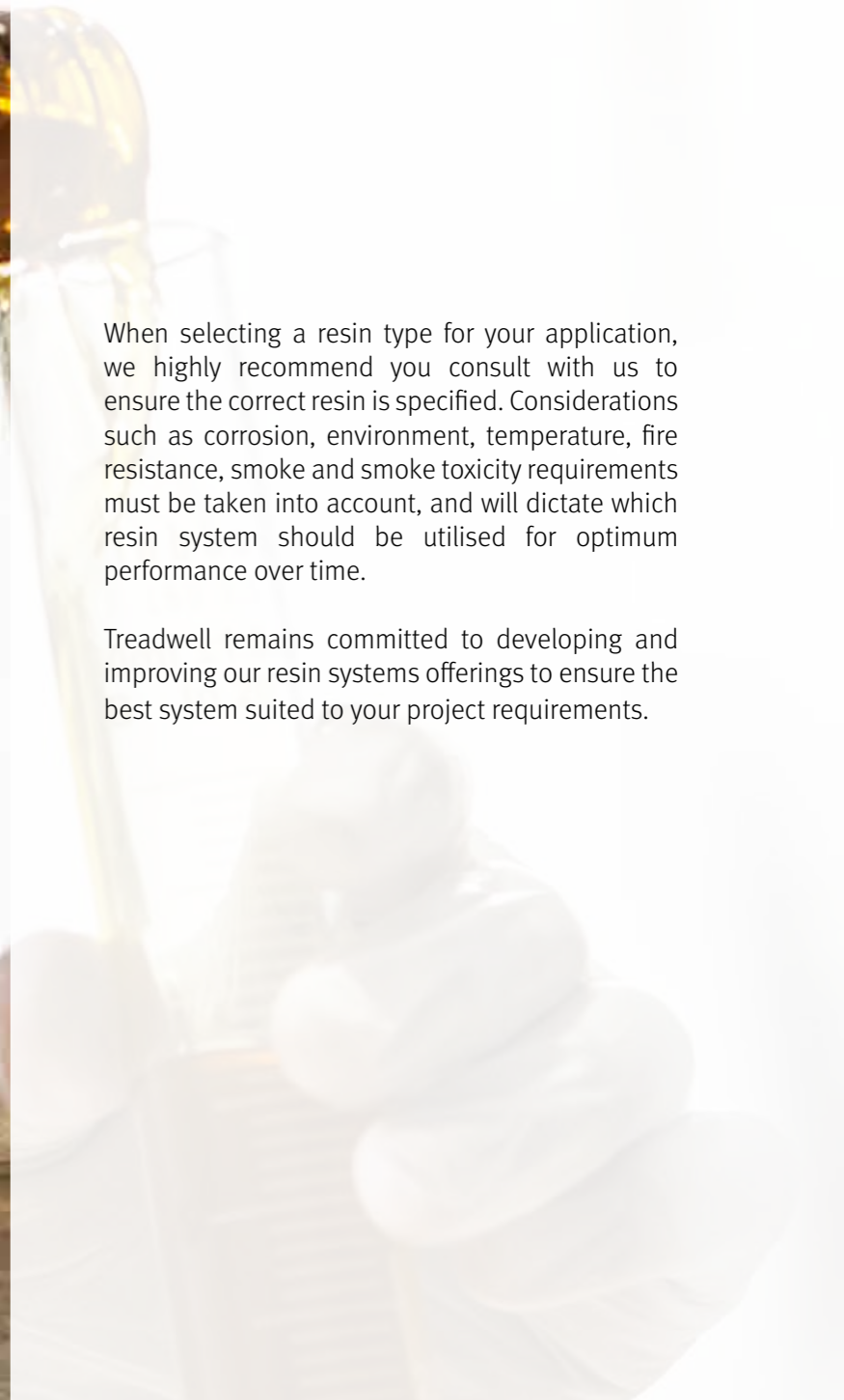
### Modulus of Elasticity

Temperature	Polyester	Vinyl Ester
37°C	100%	100%
51°C	90%	95%
65°C	85%	90%
79°C	Not Recommended	88%
93°C	Not Recommended	85%



When selecting a resin type for your application, we highly recommend you consult with us to ensure the correct resin is specified. Considerations such as corrosion, environment, temperature, fire resistance, smoke and smoke toxicity requirements must be taken into account, and will dictate which resin system should be utilised for optimum performance over time.

Treadwell remains committed to developing and improving our resin systems offerings to ensure the best system suited to your project requirements.



## OUR PARTNERS





**Contact Us**

1800 246 800 (AU) 0800 246 600 (NZ)

[sales@treadwellgroup.com.au](mailto:sales@treadwellgroup.com.au)

[sales@treadwellgroup.co.nz](mailto:sales@treadwellgroup.co.nz)

[treadwellgroup.global](http://treadwellgroup.global)