

TECH OFFER

Fast-Curing and Ready-to-Use Glass Fibre Reinforced Polymer (GFRP)



KEY INFORMATION

TECHNOLOGY CATEGORY:

Materials - Composites

Sustainability - Sustainable Living

Chemicals - Polymers

TECHNOLOGY READINESS LEVEL (TRL): **TRL8**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174821**

OVERVIEW

Fibre reinforced polymer (FRP) is widely used for blast protection and structural reinforcement of concrete elements in buildings and infrastructure. However, conventional FRP solutions have limitations due to labour-intensive applications such as on-site preparation and resin mixing, inconsistent quality, long curing time, and low productivity.

The technology is a glass fibre reinforced polymer (GFRP) roll pre-saturated with a tacky resin system that can be easily applied to structural elements like "double-sided tape". The resin-infused GFRP can fully cure in natural light within a few hours, strengthening the structure with only a marginal increase in wall thickness. A fire-retarding version of GFRP is also available. The GFRP solution is fast and efficient with minimal on-site tools and less dependent on workmanship skills.

The technology is available for IP licensing and collaboration with industrial partners who are interested in adopting the fast-curing GFRP technology in their products and applications.

TECHNOLOGY FEATURES & SPECIFICATIONS

The GFRP is a composite material made of glass fibres and a proprietary polymer resin that hardens only when exposed to light. The unique feature of polymer resin enables GFRP to be packed into a ready-to-use roll of sticky wrap.

The technical features and specifications are listed as follows:

- GFRP can be easily applied like “double-sided tape” without additional equipment
- GFRP can fully cure in natural light within a few hours, forming a reinforcing shell of 1.2mm per layer
- Additional layers can be applied to meet the overall strength requirement
- Factory-controlled quality ensures consistent application compared to conventional methods
- GFRP has an ultimate tensile strength of 750MPa, a tensile modulus of 35GPa, and a pull-off strength of 5-5.8MPa

POTENTIAL APPLICATIONS

This technology can be deployed in the building and construction industries. The potential applications are as follows:

- Blast protection for critical infrastructure
- Roof reinforcement of ageing buildings
- Reinforcement of concrete columns and walls
- Strengthening of pre-cast members
- Repair of cracked concrete walls
- Repair of structures damaged by fire
- Repair of leaking pipes

UNIQUE VALUE PROPOSITION

- Fast curing system achieves full strength in 3 hours under suitable conditions
- Easy application without on-site mixing allows for a cleaner and tidier work site
- Up to 30% cost savings in time and manpower
- Factory-controlled quality ensures consistent application

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