

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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