

FRP / Composite Wrap for Structural Strengthening in Land and Marine Environment

Carbon/Glass Fibre Reinforced Polymers (FRP), also called composite materials, are popularly used in structural strengthening for steel, wood, concrete, seaport and aerospace applications because of their cost-effectiveness and superior performance in high strength, light weight, corrosion resistance, bomb blast and earthquake protections. American Society for Testing and Materials (ASTM), American Concrete Institute (ACI), British and European Standards established design and test criteria for metal and concrete structural repair for decades.

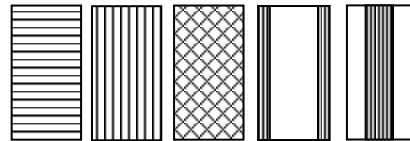
Applications

Three field repair methods are commonly used: filament winding, dry installation and wet installation method.



Design

BS 8110, EN 1504, ACI 440 and composite laminate analysis are used in structural design.



Wrapping Process, Qualification Tests and Long-term Structural Health Monitoring (SHM)

- Surface preparation
- Installation of FRP composite wrap
- Quality control
- Surface finishing
- Pull-out test, scaling-down load test and NDT test
- Full-scale load test, aging test, corrosion monitoring, fibre optic sensing (FOS) SHM test

FRP / Composite Wrap Systems

	Polymer/Epoxy		Fibre	
Land Applications	Pot Life Curing Schedule Curing Condition Workability Operating Temperature Shore D Hardness Lap Shear Strength	2 hours Overnight at room temperature Dry surface Good -45~125°C >75 Good	Fibre Type Area Weight Width Weave Pattern	E-glass 865g/m ² 1.27m Unidirectional
Marine Applications	Pot Life Curing Schedule Curing Condition Workability Shore D Hardness Lap Shear Strength Shelf Life	30~45 minutes Overnight at room temperature Underwater or wet surface Good >75 Good 1 year at 25°C, no refrigerator	Fibre Type	Carbon

Specifications subjected to change