UD Carbon Fiber Plate

Steel plate bonding has been widely used for structural strengthening of concrete buildings, bridges and other structures.
However, during the last two decades, carbon fiber reinforced polymer (CFRP) composites have been dominating
the rehabilitation and strengthening construction market, particularly, transportation infrastructure.
CFRP systems could be used to improve stiffness, strength,
and ductility of existing concrete/steel/masonry/wood structures.
Their application in concrete structures is almost unlimited,
as they could be used to strengthen slabs, beams, walls, and columns.
Horse Construction Company offers a complete system of carbon fiber plates
and epoxy adhesive system for all types of structural components and systems.

▲▲ Advantage of HM UD Carbon Fiber Plate

- →→ HM carbon fiber plates are manufactured under very high quality control, in dust free and environmentally controlled facilities, where temperature and humidity are well controlled. As a result, Horse Construction products easily meet very high standards in both domestic and international markets.
- →→ Use of automatic temperature-controlled heating system during manufacturing results in maintaining a uniform pultrusion process, and therefore producing CFRP plates that have reliable stable pulling strength.
- →→ Autonomous large-ton hydraulic traction system fully guarantees the precise control of tension and line speed, ensuring the flatness and straightness of the carbon fiber plate without any internal residual stress.
- →→ Self-developed carbon fiber constant creel makes each carbon fiber yarn smooth before dipping into the epoxy bath, no scratches after the glue application, and the fibers are distributed evenly, to ensure the integral curing of CFRP plate.

▲▲ Product Characteristics

- →→ Light weight, easy to use, easy to operate and does not require large construction equipment.
- →→ High strength, when bonding carbon fiber plates, the epoxy adhesive does not flow, can reduce the impact on the site environment during operation.
- →→ Easy to apply in industrial facilities and buildings where service pipes might be running under concrete slabs.
- →→ The shape and weight of structural components are not changed after strengthening.
- →→ The reinforcement effect of 1 layer of carbon fiber plate is equivalent to 4 to 8 layers of carbon fiber sheets, which results in tremendous saving on the labor-cost.
- →→ The visual inspection is easy to be carried-out after construction.

▲▲ Application Range

- →→ The remedy repair and strengthening of the slab and beam of concrete structures.
- →→ The strengthening of the opening sides in walls and slabs.
- →→ The strengthening of beams of wooden buildings, etc..
- →→ The strengthening of bridge slab, bridge pier and girder.
- →→ The remedy repair and strengthening of tunnel and cable lines.
- →→ Alteration of structural system.

▲▲ Basic Parameters

Specification	Size	
HM-1.2T	Thickness	1.2mm
	Width	50mm/100mm
	Length	100m/roll
HM-1.4T	Thickness	1.4mm
	Width	50mm/100mm
	Length	100m/roll

▲▲ Technical Parameters

Description	Grade Ⅰ Technical Properties	Grade Ⅱ Technical Properties
Tensile Strength (ASTM D3039) (MPa)	2600	2200
Tensile Elastic Modulus (ASTM D3039) (MPa)	1.6×10^5	1.4×10^5
Elongation at Break (ASTM D3039) (%)	1.6	1.4
Shear Strength (ASTM D732) (MPa)	80	70
FRP With Base Materials Bonding Strength(MPa)	For concrete and masonary:≥2.5MPa, concrete cohesion failure	
Fiber Volume Content(%)	≥65	≥55

▲▲ Operation Process

→→ Mark location of CFRP plates on concrete surface, as per design drawings.

→→ Grind concrete surface to remove paint off the surface, blow out or vacuum the concrete dust produced by the grinding operation. Repair the concrete surface, if needed.

→→ Prepare Epoxy Adhesive: mix components A and B to a uniform consistency in supplied containers, by weight at a ratio A:B=2:1.

→→ Applying adhesive: apply the above mixed epoxy adhesive onto the surface of carbon fiber plate evenly along the length of the CFRP plate (transversely, more adhesive near the center of the plate), please avoid bubbles.

→→ Installation: attach the carbon fiber plate to the concrete surface, and hold with steel strip, remove excessive glue compounds around, and fix with steel framework.

→→ Curing: curing time should not be less than 24 hours at room temperature.

▲▲ Transportation and Storage

→→ This product should be stored in a dry, cool and well-ventilated environment. It should not be stored under direct sunlight and/or rain. It should not be impacted with sharp objects.

→→ Carbon fiber materials during transport and storage shall not be squeezed/compressed, so as to avoid carbon fiber damage, or stored under direct sunlight and/or rain.

▲▲ Package

The length of the product is 100m, the plate width is available in 50mm, and 100mm; and the thickness is available in 1.2mm, and 1.4mm.

The 100m plate is rolled in a compact package. Other specifications could be customized.

▲▲ Safety Measures

→→ The construction workers should take all necessary protective measures (such as wearing masks, gloves, goggles, etc.).
Safety measures should be taken on site to keep the site clean and prevent fire hazards.

→→ When unrolling the CFRP plate out of the package, extra attention should be exercised, as it is rolled under pressure.

→→ Carbon fiber is conductive, safety measures should be taken to prevent electric shocks, particularly near electric equipment.