

LUCL™

L-Shaped Unidirectional Carbon Laminate



Building
&
Transportation



Oil, Gas
&
Industrial



Offshore
&
Onshore



Water
&
Wastewater



PRODUCT DESCRIPTION

The CTech-LLC[®] L-Shaped UD Carbon Laminate or Plate (**LUCL™**) is a high strength, pre-manufactured carbon/epoxy laminate. These laminates are used as externally bonded reinforcement providing additional strength in shear and stiffness to concrete, masonry, and wood structural elements. The laminates are bonded to the structural element using two part, 100% solids, high strength structural adhesive system. The resulting repair is lightweight, non-corrosive and is much easier to install than steel.

ADVANTAGES

- CFRP L-shaped laminate with a 90° bend.
- High tensile strength
- Shear enhancement.
- Light weight
- Low overall thickness can be over coated.
- Non-corrosive reinforcement system
- Compatible with different resins such as: Epoxy Resin, Polyester, Phenolic, Polyurethane and Vinylester.
- Easy installation
- Minimal aesthetic impact.

TYPICAL USES

Structural Strengthening

- Increasing the live loads capacity of floor systems
- Increasing shear strengths of reinforced and pre-stressed beams
- Increasing the live load capacity of parking garages

Seismic Strengthening

- Masonry and concrete shear walls strengthening

Damage to Structural Parts

- Correct strength deficiency due to deterioration and corrosion
- Restore strength of structural elements damaged by fire

Change in Structural System

- Load redistribution due to removal of walls, beams or columns

- Reinforces slabs for new openings

Design or Construction Defects

- Insufficient amount of shear reinforcement
- Insufficient size and/or layout of reinforcement

DESIGN

Design calculations shall be made and sealed by a licensed, independent engineer knowledgeable with the design of FRP strengthening systems.

INSTALLATION PROCEDURE

PREPARATION OF SUBSTRATE

- For retrofitting applications, substrate preparation can highly effect on the quality of the performance of L-Shaped UD Carbon Laminate.
- Surface must be clean, sound and dry; it must be free of standing water and frost.
- Remove dust, laitance, grease, curing compounds, disintegrated materials.
- The surface must be prepared for bonding by means of abrasive methods such as light sand blasting, grinding, etc.
- Available uneven surfaces must be filled with a repair mortar.
- After surface preparation, the adhesive strength of the substrate must be checked by pull-off testing at the discretion of the engineer.
- LUCL™ laminates can be cut to proper length using a commercial quality heavy duty shears and both sides of laminates must be taken care to avoid

TECHNICAL DATA

	Unit	LUCL™ 500	LUCL™ 700	LUCL™ 1000	LUCL™ 1500
Density	g/cm ³	1.55	1.55	1.55	1.55
Fiber Volume Fraction	%	70	70	70	70
Primary Fiber Direction	Degree	0	0	0	0
Tensile Strength	MPa	2400	2400	2400	2400
Tensile Modulus	GPa	131	131	131	131
Elongation	%	1.87	1.87	1.87	1.87
Thickness	mm	1.2 ~1.4	1.2 ~1.4	1.2 ~1.4	1.2 ~1.4
Width	mm	50	100	50	100
Leg length short	mm	200	300	500	800
Leg length Long	mm	500	700	1000	1500

splintering.

- Use a hard rubber roller and press the laminate into the epoxy until the adhesive is forced out on both sides.
- Installation of CTech-LLC® L-Shaped UD Carbon Laminate must be performed only by specially trained and approved contractors.

Avoiding eye contact and Using safety goggles is necessary.

APPLICATION

Prepare substrate with applying a prime coat of CTech-LLC® Epoxy. Clean abraded side of strip with acetone or similar approved solvent to remove any foreign debris and let stand for 30 minutes minimum to allow for evaporation of the solvent.

Apply a 2mm minimum thickness layer of CTech-LLC® epoxy adhesive to the cleaned side of Strip. Allow sufficient time for the epoxy to reach maximum tackiness. Apply the Strip within the specified cure time of the CTech-LLC® epoxy. The CTech-LLC® laminates strip system to be applied uniformly, meeting all specifications.

STORAGE & SHELF LIFE

- CTech-LLC® L-Shaped UD Carbon Laminate should be stored in a dry and cool place at 5°-35° C.
- Keep laminates away from moisture and water contamination.
- Store laminates on original packaging until ready to use.
- LUCL™ can be used for unlimited time in proper storage conditions.

CAUTION

All components of FRP systems may cause skin irritation and sensitization. Use of chemical resistant gloves is recommended. Avoid breathing vapors and dust. Get medical attention if you are breathing with difficulty. Resins products can cause strong eye irritation.

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IMPORTANT NOTE:
Before using any CTech-LLC® product, the user must review the most recent version of the product's technical data sheet, material safety data sheet and other applicable documents, available at www.ctech-llc.com.

WARANTY:
CTech-LLC® warrants its products to be free from manufacturing defects. Buyer determines suitability of product for use and assumes all risks. Buyer's sole remedy shall be limited to replacement of product. Any claim for breach of this warranty must be brought within one month of the date of purchase. CTech-LLC® shall not be liable for any consequential or special damages of any kind, resulting from any claim or breach of warranty, breach of contract, negligence or any legal theory. The Buyer, by accepting the products described herein, agrees to be responsible for thoroughly testing any application to determine its suitability before utilizing.