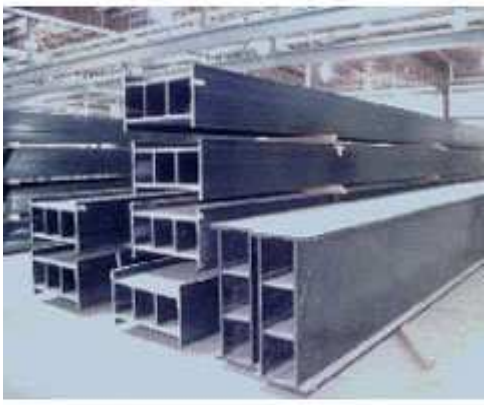
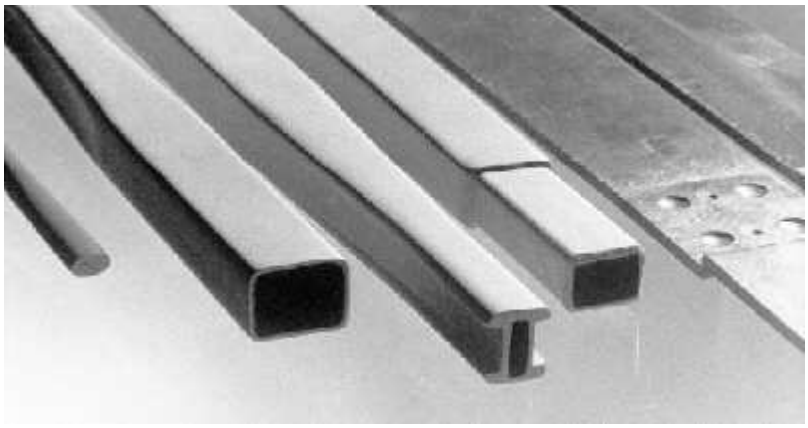
Thickness From 1.2mm & 12.00mm of CFRP Composites, High Strength & Light Weight Strengthening System for Buildings & Bridges Structures & Timber Structures

Build Strength® CF, is Composites Carbon Fiber of Pultrusion Oriented, continuous carbon fiber filaments which are held in position by a lightweight, Laminates of **CARBON FIBER Build Strength® CF** has robust handling and rapid wet-out characteristics which make it ideal for on-site strengthening of structural of buildings, bridges, beams, columns and marine structures. Additionally, **CARBON FIBER Build Strength® CF** is compatible with all commonly used adhesive systems which can be applied using a variety of wet-out/adhesive infusion techniques.

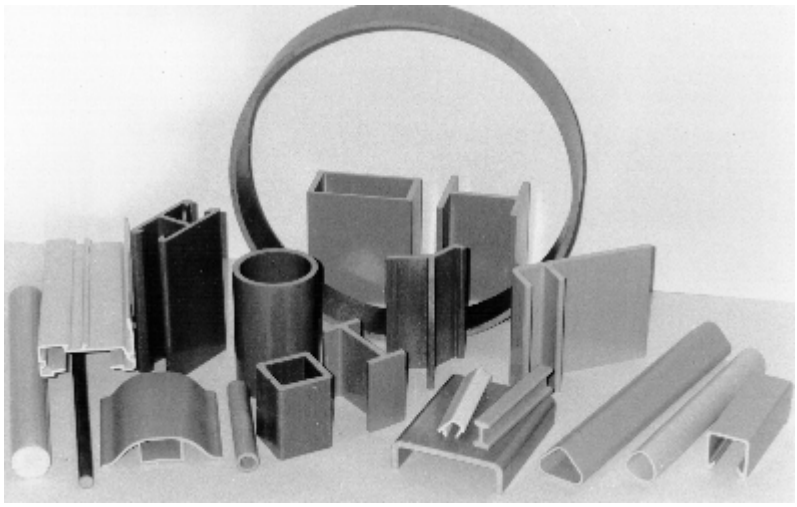
Build Strength® CF, is a Carbon Fiber Laminates, composite materials are finding applications for the reinforcement of new and the strengthening of existing structures. The materials excellent resistance to most of forms of corrosions and the ability to dissipate energy as required in earthquake scenarios make them eminently suitable for a wide rage of applications and they contribute significantly to lowering life cycle costs and increasing safety.



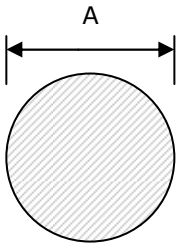
H Beam Profiles Type



Tape & SHS Profiles Type

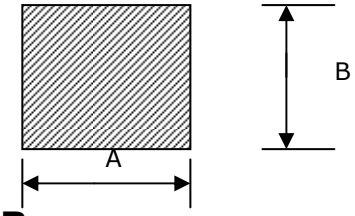


Round Squash & Other Profiles Type



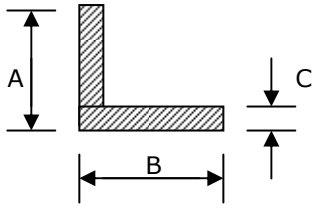
Carbon Fiber-Solid Rod

System Design Profile	Type of Fiber	Dim A mm			
Solid Rod	Carbon Fiber	5.00			
Solid Rod	Carbon Fiber	7.50			
Solid Rod	Carbon Fiber	10.00			
Solid Rod	Carbon Fiber	12.00			
Solid Rod	Carbon Fiber	16.00			
Solid Rod	Carbon Fiber	30.60			
Solid Rod	Carbon Fiber	38.10			



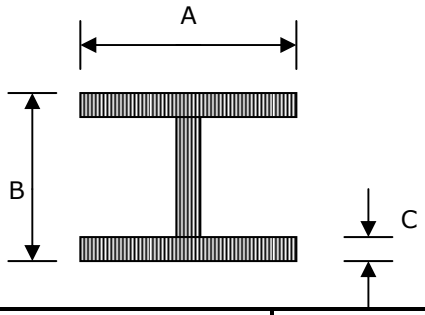
Carbon Fiber-Solid Block Bar

System Design Profile	Type of Fiber	Dim A mm	Dim B mm	Dim C mm	Dim D mm
Solid Block Bars	Carbon Fiber	6.40	6.40		
Solid Block Bars	Carbon Fiber	10.00	10.00		
Solid Block Bars	Carbon Fiber	16.00	3.50		
Solid Block Bars	Carbon Fiber	20.00	10.00		
Solid Block Bars	Carbon Fiber	30.00	15.00		
Solid Block Bars	Carbon Fiber	30.00	30.00		
Solid Block Bars	Carbon Fiber	38.10	38.10		
Solid Block Bars	Carbon Fiber	40.50	16.00		
Solid Block Bars	Carbon Fiber	50.00	30.00		



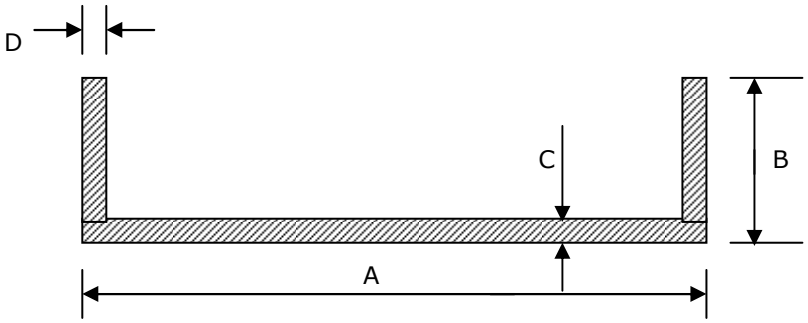
Carbon Fiber-Angle

System Design Profile	Type of Fiber	Dim A mm	Dim B mm	Dim C mm	Dim D mm
Angles	Carbon Fiber	25.00	25.00	3.00	
Angles	Carbon Fiber	50.00	50.00	6.00	
Angles	Carbon Fiber	75.00	50.00	8.00	
Angles	Carbon Fiber	76.00	76.00	9.53	
Angles	Carbon Fiber	83.00	44.00	5.00	



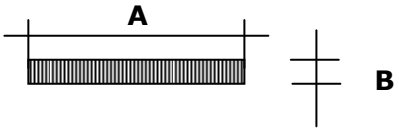
Carbon Fiber-H Beam

System Design Profile	Type of Fiber	Dim A mm	Dim B mm	Dim C mm	Dim D mm
H Beam	Carbon Fiber	8.00	25.00	7.00	
H Beam	Carbon Fiber	8.00	38.00	7.00	
H Beam	Carbon Fiber	20.00	15.00	2.00	
H Beam	Carbon Fiber	51.00	101.00	6.35	
H Beam	Carbon Fiber	53.00	50.00	7.00	
H Beam	Carbon Fiber	150.00	150.00	10.00	
H Beam	Carbon Fiber	200.00	200.00	10.00	



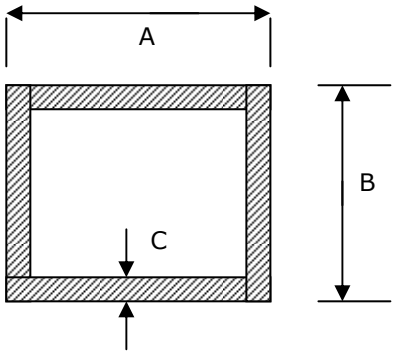
Carbon Fiber-U Channel

System Design Profile	Type of Fiber	Dim A mm	Dim B mm	Dim C mm	Dim D mm
Channels	Carbon Fiber	50.80	25.40	3.20	3.20
Channels	Carbon Fiber	100.00	30.00	4.00	4.00
Channels	Carbon Fiber	100.00	40.00	5.00	5.00
Channels	Carbon Fiber	100.00	43.00	5.00	5.00
Channels	Carbon Fiber	100.00	50.00	4.00	4.00
Channels	Carbon Fiber	200.00	30.00	4.00	4.00
Channels	Carbon Fiber	200.00	50.00	4.00	4.00
Channels	Carbon Fiber	200.00	60.00	8.00	8.00
Channels	Carbon Fiber	300.00	30.00	4.00	4.00
Channels	Carbon Fiber	300.00	50.00	4.00	4.00
Channels	Carbon Fiber	400.00	60.00	6.00	6.00
Channels	Carbon Fiber	500.00	60.00	7.00	7.00



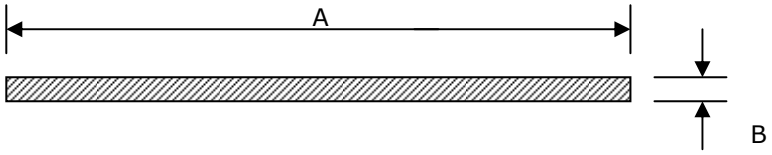
Carbon Fiber-Tape

System Design Profile	Type of Fiber	Dim A mm	Dim B mm	Dim C mm	Dim D mm
Tape	Carbon Fiber	16	2.00		



Carbon Fiber-Box Section

System Design Profile	Type of Fiber	Dim A mm	Dim B mm	Dim C mm	Dim D mm
Box Section	Carbon Fiber	25.40	25.40	3.20	
Box Section	Carbon Fiber	38.10	38.10	3.20	
Box Section	Carbon Fiber	51.00	51.00	3.20	
Box Section	Carbon Fiber	51.00	51.00	6.00	
Box Section	Carbon Fiber	80.00	20.00	5.00	
Box Section	Carbon Fiber	100.00	100.00	4.00	



Carbon Fiber-Strip Laminates/Plate

System Design Profile	Type of Fiber	Dim A mm	Dim B mm	Dim C mm	Dim D mm
Strip Laminates/Plates	Carbon Fiber	50	1.70		
Strip Laminates/Plates	Carbon Fiber	76	1.20		
Strip Laminates/Plates	Carbon Fiber	76	2.50		
Strip Laminates/Plates	Carbon Fiber	76	4.20		
Strip Laminates/Plates	Carbon Fiber	76	8.00		
Strip Laminates/Plates	Carbon Fiber	80	1.70		
Strip Laminates/Plates	Carbon Fiber	100	1.20		
Strip Laminates/Plates	Carbon Fiber	100	2.20		
Strip Laminates/Plates	Carbon Fiber	100	8.00		
Strip Laminates/Plates	Carbon Fiber	124	4.50		
Strip Laminates/Plates	Carbon Fiber	140	10.00		
Strip Laminates/Plates	Carbon Fiber	206	4.50		
Strip Laminates/Plates	Carbon Fiber	395	4.00		
Strip Laminates/Plates	Carbon Fiber	600	3.00		
Strip Laminates/Plates	Carbon Fiber	600	12.00		

Build Strength® CF Mechanical Properties of Specification

Characteristic Material Properties - Pultrusion (1:1 Mat/Roving Construction)			
Property	**Symbol**	**Characteristic Value**	
Tensile Strength (longitudinal)	$\sigma_{x,t,k}$	2300	N/mm^2
Tensile Strength (transverse)	$\sigma_{y,t,k}$	>463	N/mm^2
Tensile Modulus (longitudinal)	$E_{x,t,k}$	130	kN/mm^2
Tensile Modulus (transverse)	$E_{y,t,k}$	>35.1	kN/mm^2
Compressive Strength (longitudinal)	$\sigma_{x,c,k}$	980	N/mm^2
Compressive Strength (transverse)	$\sigma_{y,c,k}$	485	N/mm^2
Compressive Modulus (longitudinal)	$E_{x,c,k}$	-	kN/mm^2
Compressive Modulus (transverse)	$E_{y,c,k}$	-	kN/mm^2
Shear Strength (in plane)	$\tau_{xy,k}$	117	N/mm^2
Shear Modulus (in plane)	$G_{xy,k}$	2900	N/mm^2
Flexural Strength (longitudinal)	$\sigma_{x,b,k}$	1430	N/mm^2
Flexural Strength (transverse)	$\sigma_{y,b,k}$	476	N/mm^2
Flexural Modulus (longitudinal)	$E_{x,b,k}$	95	kN/mm^2
Flexural Modulus (transverse)	$E_{y,b,k}$	47.5	kN/mm^2
Poisson's Ratio (longitudinal)	ν_{xy}	-	
Poisson's Ratio (transverse)	ν_{yx}	-	

Key Properties High Tensile Modulus, High Tensile Strength, High Thermal Conductivity, Light Weight, Electrical Conductivity, Excellent Fatigue Resistance, Excellent Corrosion Resistance, Low Friction and Wear, Low Thermal Expansion, Resistance to High Temperatures, Good Creep and Damping Properties, Transparent to X-Rays, Solvent Free Working Environment

Uses ***To Strengthening Reinforced Concrete & Timber Wood***

Loading Increase Increasing of Support Live Load in Building & Traffic Growth on Bridges
Vibrating Machinery on Roof Slabs
Heavy Machinery in Commercial Building

Change Design for Structural System Dismantlement of Walls & Columns or Slabs & Beam
Reducing of Buildings & Bridges Weight

Design or Construction Defects Insufficient Reinforcements & Structural Depth

Application Method

Surfaces Preparation

Reinforced concrete surfaces shall be clean, structurally sound and free from foreign materials, contaminants, oily and other debris. Concrete surfaces shall not more than 4% moisture content and the temperature of the substrate must be at least 3 ºC which above, the current dew point temperature.

Reinforced concrete surfaces shall be clean, structurally sound and free from foreign materials, contaminants, and oily and other debris. Concrete surfaces shall not more than 4% moisture content and the temperature of the substrate must be at least 3 ºC which above, the current dew point temperature.

For filing surface irregularities such as blowholes, honeycombs & etc. Please hacking or cutting – off unloose concrete, air blowing those dust, and clean all concrete surfaces, keep over night for dry.

Using patching method of Polymer Cementitious Mortar or pumping of High Strength Cementitious Grout. But only for concrete surfaces cracks 0.25mm, must be injected with Low Viscosity of Epoxy Resin for filled. Using high pressure Air-Less Pump for injecting and penetration into structural crack lines, to achieve load bearing and adhesion bonding system.

Once patching, pumping or injecting works have been done, before laying Carbon Fiber Fabric Sheet, all surfaces must be Hammer Test for Polymer Cementitious Mortar, High Strength Cementitious Grout and Pull-Off Test for Cracks Lines. For achievement of strength requirement please consult your local Engineer.

Over Head Application
Vertical Application

Applied on Over Head or Vertical Beam and Slab, either Primer, Adhesive & Resin, Waste of materials are approximately 15%.

Mixing of Primer

Use a low speed (300 to 500 rpm) electric drill fitted with a paint mixer or a wing type paddle Pour one unit of Part A & B into drum and mix for at least 3 minutes until the mix is uniform and free. Note: Once been mixed, the Primer must be applied within 30 minutes of Pot Life.

For Uneven Surfaces
Mixing of Paste Putty

Use a low speed (300 to 500 rpm) electric drill fitted with a paint mixer or a wing type paddle. Pour one unit of Part A & B into drum and mix for at least 5 minutes until the mix is uniform and free. Note: Once have been mixing, the Paste Putty must be applied within 60 minutes of Pot Life.

Easy Installation

The easy to use Glass Fiber FRP system components assure fast, user friendly installation. A complete system is installed in only four (4) steps to properly prepared surfaces within appropriate working conditions.

System Recommended Use Resin Component

Epo Adhesive Strip is Epoxy Solvent Free
Two Component of Part A & Part B.
Sag Resistance until 6mm thick.
Up to 15 Mpa **Shear Strength**
Up to 4 Mpa **Peel Strength**
Suitable for applied on Over Head or Vertical Surfaces

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1. Roll "Epo Bond Primer"

Apply **Epo Bond Primer,** at rate applied 0.20 kg/m2 to 0.30 kg/m2, is a low viscosity of **Primer Resin** that can be applied using a roller.
(Wait for ½ to 1 hours curing)

2. Apply "Epo Adhesive Strip"

Apply **Epo Adhesive Strip**, at rate applied 0.34 kg/meter linear to 1.5 kg/meter linear, paste adhesive is a high solids, non sag paste Epoxy Based or Polyurethane Based material that is applied using a Spatula Tools to level concrete surfaces.
Note: Min of Thickness of Adhesive Shall be at least 0.5 mm
(Curing time: ½ hour to 4 hours depend of whether temperature)

3. Apply Carbon Fiber of "Build Strength® CF"

Within the open time of the adhesive, place immediately the **Build Strength® CF Profile** onto the adhesive surfaces, using roller or other tools to press the laminates into the adhesive until is forced out on both sides of the laminates.
Before the adhesive curing. Immediately remove surplus adhesive on both sides

Clamp The **Build Strength® CF**. The joint component should be assembled and clamped as soon as the Adhesive has been applied. An even contact pressure throughout the joint area will ensure optimum cure.

LaMaCo Science Chemical

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