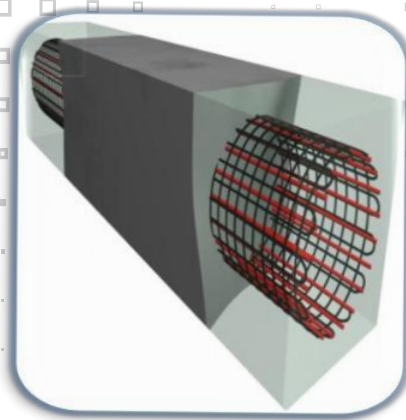




# Chem Coats (Pvt) Ltd.

formerly  Abepak Pvt. Ltd.

## Chem Coats Carbon Fiber Structural Reinforcement System



*It is Investment not an Expense  
investment...!*

*Invest in quality protect you*



**Chem Coats (Pvt) Ltd.**

# Carbon Fiber Structural Strengthening System

## Unidirectional Carbon Fiber Fabrics

## Carbon Fiber Plate

## Adhesives

### DESCRIPTION

A high strength system used for strengthening structure due to any reason such as;

- Deterioration due to wear and tear.
- Settlement of cracks.
- Increasing the load as required.
- Repairing existing structures after any such as earth quake, flood and fire damage etc.

### USES

- Increased live load capacity in buildings and bridges, floors, roofs of buildings, etc.
- Seismic retrofit of structural elements such as columns, unreinforced masonry walls, etc.
- Repair of large diameter pipes to achieve strengthening and water proof.
- Repair of damaged structural components caused by aggressive environments, fire, aging, etc.
- Changes in structural system: new openings in floors, removal of existing walls, etc.
- Correction of design or construction errors: misplaced reinforcing bars, insufficient structural depth.

### FEATURES

- Very strong and light weight strips ideal for confined spaces.
- Used for flexural and shear strengthening.
- High modulus of elasticity
- Fully compatible and excellent adhesion to epoxy resins.
- Non-corrosive.
- Light weight does not alter mass & dynamic loads on structure.
- Alkali resistant.
- Thin sections can be easily crossed and overlapped.

### BENEFITS

- Light weight and easy to use.
- Acid & weather resistance.

- Very high tensile strength which is equal to 10 to 15 times that of ordinary steel.

### AREAS OF APPLICATION

- Bridges
- Columns
- Beams
- Reservoirs (Water & Oil)
- Roof
- Silos
- Scissors wall
- Chimney
- Concrete Pipe
- Tunnel
- Building reinforcement

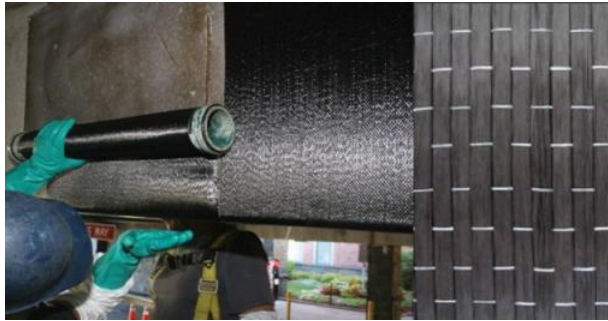




## Unidirectional Carbon Fiber Fabric

### FEATURES & BENEFITS

- Light weight, easy to construct, and minor increase in the weight on constructed base materials.
- Soft, free to cut, is suitable for a variety of shapes structures, and have close adhesion with reinforced concrete surface.
- The thickness is small, so it is easy to overlap.
- High tensile strength, high flexibility and have the same effect as to use steel plate reinforcement.
- Anti-acid and alkali, corrosion resistance, and can be used in any harsh environment.
- The supporting epoxy resin impregnated adhesive has good permeability, the construction is simple and time required is short.
- Non-toxic, non-irritating odourless.
- It has high tensile strength which is equivalent 10-15 times to ordinary steel.



### APPLICATION

The fabric can be cut with special scissors or razor knife. Never fold the fabric.

This product may only be used by experienced professionals.

Minimum radius required for application around corners is > 20mm. Grinding edges may be necessary. In fiber direction, overlapping of the fabric must be at least 100mm.

For side-by-side application, no overlapping length in the weft direction is required. Overlaps of additional layers must be distributed over the column circumference.

The strengthening application is inherently structural and great care must be taken when choosing suitably experienced contractors.

### CONSUMPTION

Dry application

- Impregnating of the first layer including primer ~ 1.0-1.5kg/m<sup>2</sup>
- Impregnating of the following layers ~0.8kg/ m<sup>2</sup>

### SUBSTRATE QUALITY

- Specific requirements
- Minimum substrate tensile strength is 1.0N/ m<sup>2</sup>

### PACKAGING

Fabric Width: Flexible  
Roll Length: Flexible  
Adhesive (ChemCoat CFF Epoxy) 05 Kgs (A+B)

### Dry Fiber Properties

Model Name	CC-200	CC-300
Fiber Specs.	12 K	12 K
Tensile Strength	4900 MPa (Nominal)	3400 MPa (Nominal)
Tensile Modulus of elasticity	240 GPa (Nominal)	230 GPa (Nominal)
Ultimate tensile strain	1.5%(Nominal)	1.5%(Nominal)
Nominal Thickness	0.111 mm	0.167 mm
Fabric Weight	200 gsm	300 gsm
Appearance	Black color & Glossy	Black color & Glossy
600 gsm fabric weight also available.		

### Laminate Properties @ 1.0 mm thickness

		200 gsm	300 gsm
Tensile strength ASTM D-3039	341ksi	2560MPa	2350MPa
Tensile modulus ASTM D-3039	18.9Msi	146GPa	135GPa
Tensile strain ASTM D-3039	1.7%	1.75%	1.7%
Compressive strength ASTM D-695	215ksi	1470MPa	1470MPa
Flexural strength ASTM D-790	245ksi	1670MPa	1670MPa
Flexural modulus ASTM D-790	17.5Msi	120GPa	120GPa
Inter Laminae shear strength ASTM D-2344	13ksi	9kgf/mm <sup>2</sup>	9kgf/mm <sup>2</sup>
90° tensile strength ASTM D-3039	10.0ksi	69MPa	69MPa





# Chem Coats (Pvt) Ltd.

## DESCRIPTION

ChemCoat Carbon Fiber Fabric (CCFF) epoxy adhesive of high performance, can be used for the effective penetration bonding between many substrate materials such as concrete, steel material, ceramic, stone, wood component and many fiber fabrics such as carbon fiber, glass fiber, basalt fiber, aramid fiber. It is mainly used for the strengthening and reinforcement of buildings.

### **ChemCoat CCFF Epoxy Properties**

Appearance	Component A : transparent viscous liquid Component B : brown viscous liquid
Bonding strength	C60 concrete damage
Viscosity of Mixture	4000-6000 Pa.s
Steel – steel bonding Strength Mpa	≥14
Operable time (min) (25°C)	≥30
Finger touch dry time (20°C,h)	1~2
Mixture ratio by weight	A:B = 2:1
Curing material density	1.10 ± 0.10g/cm <sup>3</sup>
Pulling adhesion strength (Mpa)	≥2.5



## Carbon Fiber Plate

### USES

It used in the reinforcement of concrete beam resist- bending and shearing. Suitable for

- Concrete floor board
- Bridge board
- Brick masonry walls
- Scissors wall
- Bridge pillars
- Chimney
- Tunnel
- Pool
- Concrete pipe etc.

### FEATURES & BENEFITS

- Tensile strength is several times more than ordinary steel. It has excellent creep, corrosion earth quake resistance.
- High strength, light weight is 1/5 of steel, high toughness, can be spired & can be used with long length.
- Does not need to be pre-processed, simple processes; the plate can be cross-used.

### SURFACE PREPARATION

Proposed construction plan, and prepare tools and materials.

#### Base substance of concrete

Remove surface oil, dirt and other loose aggregate. Repair the surface, uneven sections or holes, to keep the surface levelness. Light sandblasting, grinding, or other pro-bonded construction method process are necessary to improve the bonding capacity between plate and the substrate. The concrete base strength should be higher than  $1.5N / mm^2$  )

#### Base substance of steel

Remove surface dirt, oil and grease, rust. High-pressure cleaning, grinding or sandblasting is recommended.

#### Base substance of wood

Remove surface oil and impurities, sand blast or grind rough the surface of wood.



PROPERTIES		
Item	CCFP 1.4	CCFP 1.2
Thickness	1.4 mm	1.2 mm
Tensile strength	≥ 2400Mpa	≥ 2400Mpa
Elastic modulus (Mpa)	≥ $160 \times 10^5$	≥ $160 \times 10^5$
Volume Content of Fiber	≥ 65 %	≥ 65 %
Pulling Bonding Strength with Concrete	≥ 2.5Mpa	≥ 2.5Mpa
Interlaminar Sheer Strength	≥ 50 Mpa	≥ 50 Mpa
Elongation	≥ 1.7%.	≥ 1.7%.

### Preparation of epoxy resin

Mix according to the ratio 2:1(by weight). To mix the epoxy resin, add all the material into the container, and then stir by a stirrer uniformly. Do not mix too much resin at one time. Nominal coverage is  $1 Kg/m^2$ .

### APPLICATION

According to the design, cut the carbon plate. Clean the surface of carbon plate. If pasting two layers, the both sides of the bottom layer plate should be cleaned.

Apply epoxy resin onto the substrate with a trowel or spatula to a nominal thickness of 2mm. A notched trowel may be used for this application.

Use a hard rubber roller and press laminate into the epoxy until the adhesive is forced out on both sides. When, plates should be pasted parallel. The distance between two plates is less than 5mm.

Remove excess epoxy. Fixed with steel frame to offer a suitable press.

If there is some space without epoxy resin, fill it with resin immediately.



# Chem Coats (Pvt) Ltd.

## ChemCoat CCFP Epoxy Properties

Appearance	Component A: Transparent viscous liquid Component B: Black Putty
Viscosity of Mixture	≤16-20 mPa.s
Steel – steel bonding Strength Mpa	≥15
Operable time (min) (25°C)	≥30
Finger touch dry time (20°C,h)	1~2
Mixture ratio by weight	A:B = 2:1
Curing material density	1.50 ± 0.10g/cm <sup>3</sup>
Pulling adhesion strength (Mpa)	≥2.5

materials as we have no controls over methods of applications, site conditions etc. In view of the continuing research and development being undertaken in our laboratories we advise customers in their own interest to ensure that this data sheet has not been superseded by a more up-to-date publication. All products are sold subject to our standard conditions of sale which are available on request. Field services, where provided, does not constitute supervisory responsibility. For additional information, please contact your local **Chem Coat's** representative.

### HANDLING & STORAGE

Unlimited shelf life in proper storage conditions. Store in dry place at 45° -95° F (7° -35° C).

### HEALTH & SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent Material Safety Data Sheet (available upon request) containing physical, ecological, toxicological and other safety-related data.

It is non-reactive and fully cured. They do not require a Material Safety Data Sheet (MSDS). However, caution must be used when handling since a fine carbon dust may be present on the surface. Gloves must therefore be worn to protect against skin irritation. Caution must also be used when cutting the strips to protect against airborne carbon dust generated by the cutting procedure. Use of an appropriate, properly fitted NIOSH approved respirator is recommends.

### IMPORTANT NOTE

The information given in this data sheet is based on current development work and many years of field experience. Whilst every effort is made to ensure that the information is reliable, we cannot accept responsibility for any work carried out with our

## RANGE OF PRODUCTS

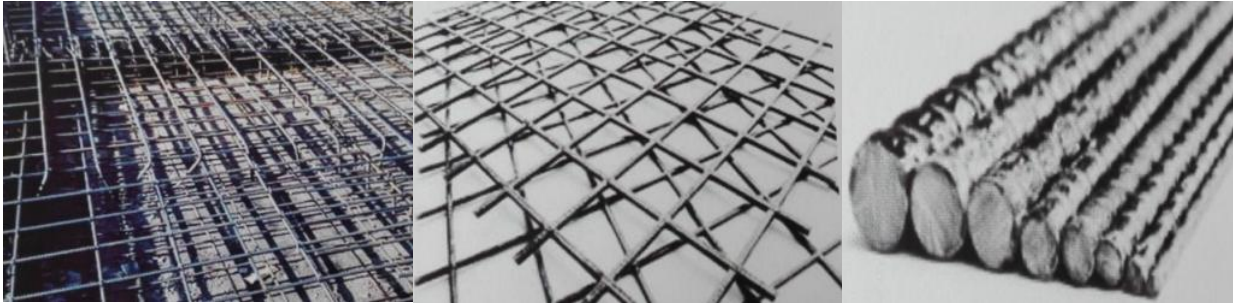
<u>WATERPROOFING SYSTEMS</u> <u>INDUSTRIAL FLOOR SURFACES</u> <u>PROTECTIVE COATINGS</u>	<u>PREPACKED REPAIR MORTARS</u> <u>CEMENTITIOUS &amp; EPOXY GROUTS</u> <u>CONCRETE ADMIXTURES</u>	<u>SEALANTS</u> <u>CRACK INJECTION</u> <u>CONCRETE ADHESIVE</u>
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## **CARBON FIBER RELATED OTHER PRODUCTS**

### **BASALT FIBER REBAR (BFRP)**



### **INTRODUCTION**

It is a new kind of composite material made with basalt fiber, combined with epoxy resin and curing agent. The density of BFRP is  $1.9 - 2.1 \text{ g/cm}^3$  making it 8 – 10 times lighter than steel. The tensile strength of 25 mm bar is 780 Mpa.

Basalt fiber rebar is rust less, electrical insulator, non-magnetic, especially with great acid and alkali resistance. It could enhance the durability of construction.

### **CARBON FIBER REBAR (CFRP)**



### **INTRODUCTION**

It is made of composite material with carbon fiber as reinforcement, cured by special epoxy resin and curing agent. Shaped by pultrusion molding process.

It is light weight with high tensile strength, density  $1.6-1.8 \text{ g/cm}^3$ , tensile strength 1800-2200 Mpa. Excellent electricity, corrosion, high temperature and acid resistance.

### **BASALT FIBER GEOGRID**



### **INTRODUCTION**

Basalt Fiber Geogrid is a kind of reinforcement product, which uses the anti-acid & alkali basalt continuous filament (BCF) to produce gridding base material with advance knitting process, sized with saline and coated with PVC. Can be used under super-low temperature and have good thermal stability.

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