

BYFabric-300UC CF S



Unidirectional Carbon Fiber Fabric For Strengthening

Product Description BYFabric-300UC CF S is a high-strength, high-modulus unidirectional carbon fiber fabric.

It is laminated with epoxy resin adhesive to form a carbon fiber reinforced polymer laminate (CFRP) used for structural reinforcement.

Carbon fiber not only has high strength and high elastic modulus but also features lightweight and durability.

Initially used in aerospace and automotive industries, it has since been adopted by sports equipment and mechanical industries.

In recent years, as an alternative material for concrete structural reinforcement, it has been widely used in seismic reinforcement of highway structures, railway and bridge piers, tunnels, and buildings.

Currently, exploration is underway to use it for structural modifications of highway bridges to increase traffic capacity.

Application Range

■ Load Increase

Increase in loads in commercial buildings
Increase in traffic weight and volume on bridges
Installation of heavy equipment in industrial facilities
Increase of vibration in structures

■ Improve Structural Condition

Reduce deformations
Reduce stresses in existing structural elements
Limit or arrest crack propagation

■ Seismic Retrofitting

Columns wrapping reinforcement for improving ductility and shear strength
Masonry walls reinforcement for improving out-of-plane bending and in-plane shear strengths
Beam and slab reinforcement

■ Change Structural System (Structural Alterations)

Removal of walls or columns
Removal of slab sections for openings

■ Aging and Damaged Structures

Aging of old deteriorated construction materials
Corrosion of steel bars in concrete
Vehicles collusion impact on structures (impact damage)

■ Design or Construction Errors

Lack of adequate well-detailed reinforcing bars
Inadequate member cross section
Substandard concrete material strength

Product

Characteristic

■ Light self-weight:

Allows operation in a narrow and tight spaces;
Minimal impact on the normal use of the structure during construction;
Adds almost no additional weight to the existing structure.

■ High strength, high modulus:

Very effective in flexural strengthening in the form of straight sheets, shear strengthening in the form of closed loop wrapping, U-shaped and side bonding;
Increase ductility and strength of circular columns in the form of transverse wrapping;
Restoration of various complex shape structural elements.

■ Wide application range:

Suitable for surface of various structural components:
Beams, columns, ventilation tubes, pipes, walls, etc.;
It could be used on various types of structural components and systems, e.g. concrete structures, masonry structures, wood structures, steel structures, and many other structural elements and systems.

■ Anticorrosion:

Anti-acid, alkali and other chemical corrosion and resistance to severe environments.

■ Long storage life:

Allows for long operation projects and extended deadlines.

■ High temperature resistance, limited creep resistance under high permanent loads, high corrosion resistance and excellent seismic strengthening system.

Boyue Advantage

■ Aviation Grade Yarn

Produced from high-quality international aviation grade yarn, every carbon fiber yarn length kept over 5000 meters to ensure the continuity of the carbon fiber fabrics without damage raw fiber.

■ World Leading Production Line

Germany imported intelligent production line. Point to point active wefting insertion. No damage or break of filament during the whole production process.

■ Less Epoxy Adhesive Usage

The carbon fiber fabric is woven evenly and smooth, moderate soft, good suitability with the impregnated adhesive, which are easy to impregnate.

The total adhesive usage is just 15%, less than products by other manufacturers, and the hollow issues maintained at 80% less than other products.

■ Large Output and Timely Delivery

Annual production capacity of quality carbon fiber fabric is 5 million square meters, while maintaining a daily stock of over 100,000 square meter to meet any project's demands, around the world.

Technical Specifications

Model	Specifications	Strength Grade	Thickness
BYFabric-200UC CF S	5.84 oz/sq.yd. (200g/m ²)	High strength Grade I	0.111mm
BYFabric-200UC CF	5.84 oz/sq.yd. (200g/m ²)	High strength Grade II	0.111mm
BYFabric-300UC CF S	12.66 oz/sq.yd. (300g/m ²)	High strength Grade I	0.167mm
BYFabric-300UC CF	12.66 oz/sq.yd. (300g/m ²)	High strength Grade II	0.167mm
BYFabric-400UC CF S	16.88 oz/sq.yd. (400g/m ²)	High strength Grade I	0.222mm
BYFabric-400UC CF	16.88 oz/sq.yd. (400g/m ²)	High strength Grade II	0.222mm
BYFabric-600UC CF S	25.31 oz/sq.yd. (600g/m ²)	High strength Grade I	0.333mm
BYFabric-600UC CF	25.31 oz/sq.yd. (600g/m ²)	High strength Grade II	0.333mm

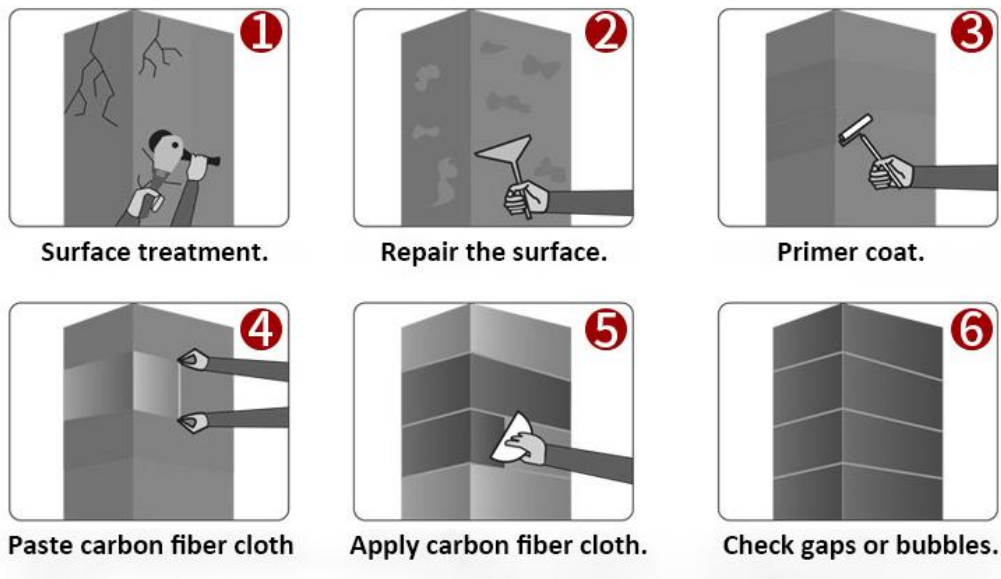
Model	BYFabric-300UC CF S
Appreance	Black fabric
Length	100m
Width	Regular width is 100mm, 150mm, 200mm, 250mm, 300mm, 500mm, other width can be customized.
Shelf Life	10 years
Storage Conditions	Store in dry conditions at 40°F to 95°F (4°C to 35°C)
Braiding	0° (Unidirectional)
Areal Weight	12.66 oz/sq.yd. (300g/m ²)
Package	This product uses carton package. When the width is 100mm, 200mm, 300mm, the total area of carbon fiber per case is 60 m ² ; when the width is 250mm, 500mm, the total area of carbon fiber per case is 50 m ² .

PRODUCT SPECIFICATIONS	UNIT OF MEASURE	SPECIFIED RANGE	TEST METHOD
Carbon Fiber Model: 12K High-Strength Carbon Fiber			
The following displays the performance of carbon fiber.			
Sizing Agent Content	%	0.6~1.2	GB/T 29761-2013
Density	g/m ³	1.78~1.82	GB/T 30039-2013
Number of Filament		12K	
Linear Density	g/km	794~806	GB/T 3362-2017
Tensile Strength	MPa	≥4900	GB/T 3362-2017
Discrete Coefficient (C.V.) of Tensile Strength	%	≤6	GB/T 3362-2017
Tensile Modulus	GPa	220~260	GB/T 3362-2017
Elongation at Break	%	≥1.8	GB/T 3362-2017

The following table shows the properties of the weft fiber.			
Type of Fiber		Hot melt composite fib	
Line Density	g/km	≤50	GB/T 3362-2017

PRODUCT SPECIFICATIONS	UNIT OF MEASURE	DETECTED DATA	TEST METHOD
The following displays the performance of the fabric.			
Tensile Strength (Standard value)	MPa	≥ 3400	GB 50728-2011
Tensile Modulus of Elasticity	GPa	≥ 230	GB 50728-2011
Elongation at Break	%	≥ 1.6	GB 50728-2011
Bending Strength	MPa	≥ 700	GB 50728-2011
Interlaminar Shear Strength	MPa	≥ 60	GB 50728-2011
Positive Tensile Bond Strength Between FRP and Substrate (Average value)	MPa	For concrete and brick base: ≥ 2.5 For steel base: ≥ 3.5 And it must not be adhesive failure	GB 50728-2011

Construction Process



- 1. Surface treatment:** Use a grinder to remove the coating on the concrete surface. Polish the surface. If there are angles, grind them into a circular shape.
- 2. Layout:** Ensure the concrete surface is clean and dry, then begin the layout.
- 3. Apply primer:** Apply primer adhesive on the concrete surface.
- 4. Apply putty/smooth:** If necessary, apply putty for repair and smoothing.
- 5. Cut carbon fiber cloth:** Cut the carbon fiber cloth into appropriate sizes according to the design requirements.
- 6. Prepare impregnating resin:** Weigh and mix the adhesive resin in proportion. Stir the resin until the color is even. Avoid air bubbles during this process.
- 7. Apply impregnating resin:** Apply impregnating resin when the primer adhesive is dry. (If no primer is needed, apply impregnating resin directly.)
- 8. Apply carbon fiber cloth:** Apply the carbon fiber cloth on the concrete surface according to the design requirements. Smooth the surface from one end to the other.
- 9. Check for gaps or bubbles:** Apply impregnated carbon fiber resin again. Ensure the resin fully saturates the fabric. The surface should be smooth without bubbles. If applying two or more layers, repeat the process starting from cutting the carbon fiber cloth.

Transportation and Storage

This product should be stored in a dry, cool and well ventilated environment. It should not be exposed to rain, or subjected to impact by sharp objects.

During transportation and storage, carbon fiber materials shall not be squeezed or compressed, so as to avoid carbon fiber damage, and shall not be exposed to direct sunlight and/or rain.

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.

Carbon fiber is conductive, safety measures should be taken to prevent electric shocks.

Carbon fiber sheets should not be bent during transportation, handling, and cutting process.

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