



SAINT-GOBAIN

durafibre CFP

High strength carbon fibre plate

EXTRUDED CARBON FIBRE LAMINATE FOR EXTERNAL STRUCTURAL STRENGTHENING

DESCRIPTION

durafibre CFP is a ready-to-use epoxy pre-impregnated, extruded laminated carbon fibre plate. The carbon fibre laminate system offers outstanding tensile strength for bending loads, deformation, or increased stress and E-modulus for the structural strengthening of reinforced concrete elements.

USES

- Increase load requirements:
 - Increased live loads
 - Increased traffic
 - Heavy machinery installed in buildings
 - External reinforcing flat structures like slabs and beams
 - Building/structure use change
- Damage to structures through:
 - Aging
 - Corrosion of steel
 - Seismic activity
 - Durability reduction by fire
- Durability:
 - Reduced stress in rebar
 - Prevention of further cracking
 - Suppression of crack width due to expansion
 - Reduce deformation
 - Satisfy design change requirements
- Design or construction defects/changes:
 - Structures having insufficient reinforcing
 - Structures with insufficient element dimensions
 - New openings in structure to accommodate changes

ADVANTAGES

- Easy-to-apply
- Carbon fibre offers exceptional tensile strengths and E-Modulus
- Light weight, hardly no additional weight to the structure
- Increase in bending moment
- Composite system offer outstanding fatigue properties
- Quick turn-around time for repair work
- Corrosion resistant
- Reliable structure repair system
- Long lengths reduce additional joint work
- Quality and performance is uniform due to pre-lamination of the carbon fibre with epoxy resin
- No multiple layers need to be applied
- Can be coated

TYPICAL PHYSICAL PROPERTIES

Colour	Black	
Fibre type	High strength carbon	
Dimensions	Width (mm)	Thickness (mm)
	50 and 100	1.2
	50 and 100	1.4
Tensile strength (ASTM D 3039)	> 3 000 MPa	
Elongation at break	> 1.8%	
E-Modulus (ASTM D 3039)	> 165 GPa	
Mean tensile strength at break	3 050 MPa	
Elongation at break	> 1.7%	
Density	1.5 g/cm ³	
Mass/100 m (W = width and T = thickness)	Mass	Cross sectional area
50 mm (W) x 1.2 mm (T)	9 kg	60 mm ²
100 mm (W) x 1.2 mm (T)	12 kg	120 mm ²
50 mm (W) x 1.4 mm (T)	10.5 kg	70 mm ²
100 mm (W) x 1.4 mm (T)	21 kg	140 mm ²
Shelf-life	Unlimited (store clean and dry)	

SURFACE PREPARATION

See **durafibre CFP adhesive** data sheet

Spalling repairs required: Request the relevant spalling methodology.

durafibre CFP carbon fibre plates:

Precaution:

When opening the 100 metre roll, take care when loosening the ties all at once, this may cause a hazard due to rapid unwinding. Carefully cut the length of **durafibre CFP** plate to the required length using a diamond cutter or file saw. Wear goggles, dust mask, gloves and other appropriate PPE.

Cleaning the durafibre CFP carbon plates:

Clean the rough side of the carbon plate that will be in contact with the **durafibre CFP adhesive** and concrete by thoroughly wiping using **abe® thinners No. 3** and allow it to dry, cleanliness must be maintained prior to

bonding the **durafibre CFP** plates.

APPLICATION

Precaution:

Prevailing weather conditions must be taken into account.

Thoroughly mix the **durafibre CFP adhesive** and apply the adhesive on the concrete surface using a rubber spatula 1 mm thick to enhance the adhesion properties. Also apply the mixed adhesive to the ground side of the carbon plate. The adhesive coat shall be 4 mm thick in total.

Attach the adhesive-coated carbon plate to the concrete surface by pressing. Using a rubber roller apply enough pressure to allow the excess adhesive to exude between the carbon plate panels.

Remove the excess adhesive with a rubber spatula or dry cloth.

Carbon plate attached to the concrete surface should be left alone for at least three to four hours for sufficient curing to take place.

Note: Ensure adequate ventilation is available and prohibit open flames at the site. Protect from any wind pressure in tunnels or underground rail tracks that may cause the carbon plate panels to detach from the concrete surface before curing. Keep the panels physically supported until fully cured.

Grind the first surface layer of carbon plates applied to reinforce slabs in a cross before applying the second layer.

DESIGN WORK

Consultation with a structural engineer is imperative when the design criteria and application configurations are required subject to load calculations of the various elements that are under consideration.

Curing

Protect outdoor applications from rain, dust and debris using a suitable plastic covering.

Allow the carbon plate adhesive to cure for 24 hours or more (increase the curing time when low ambient temperature is experienced).

Note: Discard mixed adhesive when its useful life is over. No solvent of whatever type should be mixed in with the adhesive. The use of any thinning solvent, coating roller or brush is strictly prohibited.

The longer the adhesive is mixed at a higher temperature, the shorter will be its useful life. The useful life varies depending on the site conditions. Discard a mixed batch of adhesive when its rising temperature or viscosity has made it difficult to apply, as this means its useful life is over.

COVERAGE – APPROXIMATE ADHESIVE CONSUMPTION

100 m length x 50 mm wide = 20 ℓ

100 m length x 100 mm wide = 40 ℓ

These calculations are theoretical and exclude waste or surface profile irregularities.

CLEANING

Cleaning of tools and equipment use **abe® super brush cleaner** before the epoxy has cured. Cured material will have to be removed mechanically.

PROTECTION ON COMPLETION

All applied product needs to be protected for at least 24 hours against the weather and high winds.

FINISHING

It is desirable to apply a polyurethane paint to the carbon fibre

plate system for protection against ultra-violet rays and or subsequent environmental conditions. See “coating types”.

Painting should be performed in not less than 24 hours after the application of the carbon plate lay-up process.

COATING TYPES

UV protection – **abecote® tough PU paint**

Damp/wet conditions – **duraflex®**, **abe® silocoat**

Submerged conditions – **duraflex®**

Chemical spill environments – **abecote® SF 356** or **SF 217**

TEMPERATURE AND RELATIVE HUMIDITY

durafibre CFP system should be applied at material temperatures between 12 °C and 18 °C and ambient temperatures of 5 °C to 30 °C. Temperatures should not fall below 5 °C in the 24 hours after application. Do not apply coating if the substrate temperature is at least 3 °C (5 °C is better) above dew point or highly humid conditions to cause condensation.

MODEL SPECIFICATION

High strength epoxy extruded carbon fibre plates incorporating an epoxy adhesive system to be used for structural strengthening.

The system shall be **durafibre CFP** high strength carbon fibre plates including the **durafibre CFP adhesive** applied in accordance with the structural engineers detail and the recommendations of **a.b.e.®**.

PACKAGING

durafibre CFP is supplied in 100 m rolls.

50 mm wide x 1.2 mm thick (code: 12601169)

50 mm wide x 1.4 mm thick (code: 12602177)

100 mm wide x 1.2 mm thick (code: 12603173)

100 mm wide x 1.4 mm thick (code: 12604178)

HANDLING AND STORAGE

durafibre CFP has an unlimited shelf-life if kept in a dry store in its sealed package.

HEALTH & SAFETY

durafibre CFP is a carbon fibre product therefore when cutting/ handling suitable protection must be employed to avoid contact with skin and eyes, avoid inhalation of particles during processing by wearing dust masks. The use of gloves, eye protection and dust masks is advised. Immediately wash with water in the event of contact with skin. Splashes into eyes should also be washed immediately with plenty of clean water and medical advice sought.

IMPORTANT NOTE

This data sheet is issued as a guide to the use of the product(s) concerned. Whilst **a.b.e.®** endeavours to ensure that any advice, recommendation, specification or information is accurate and correct, the company cannot accept any liability for application – because **a.b.e.®** has no direct or continuous control over where and how **a.b.e.®** products are applied.

FURTHER INFORMATION

Where other products are to be used in conjunction with this material, the relevant technical data sheets should be consulted to determine total requirements.

a.b.e.® has a wealth of technical and practical experience built up over the years in the company's pursuit of excellence in building and construction technology.

Please consult our website for our latest datasheets.

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