

Unidirectional Woven High Performance Carbon Fibre Fabric

Guardian CF (HP) Fabric is a unidirectional woven high performance Carbon Fibre Fabric for structural strengthening.

Complies to EN1504 Part 9 and EN1504 Part 4

Principle 4 : Structural Strengthening (SS).

Method 4.3 – Plate Bonding.

USES & ADVANTAGES

Typical uses include strengthening of structures where there are load increases anticipated, structural repairs, modification of the standard system or modifying errors in planning or construction. Applications may be grouped as follows:-

Load Increases

- Higher live load
- Increased wheel loads
- Installation of heavier machines
- Vibration
- Less deformation

Modification of structural system

- Elimination of walls / columns
- Openings cut into slabs

Improvements in suitability for use

- Limitation of deflections
- Reduction of stress in steel reinforcement
- Reduction of crack widths

Damage to structural parts

- Ageing of construction materials / damage caused by fire
- Corrosion of steel reinforcement
- Impact of vehicles

Errors in planning or construction

- Insufficient design dimensions
- Insufficient reinforcing steel section

Advantages include:

- High strength and high modulus.
- 10 times the tensile strength capacity of steel.
- Light weight. Minimal additional dead load.
- Does not corrode. High durability low maintenance.
- Minimal increase in member geometry.
- Easy to hide and overcoat.
- Flexible easy to install on difficult shapes.
- Easy to install minimal down time.
- Chemical resistance.
- Neutralizes the effect of cracks.
- Applied to cracks on concrete surface improves
- Significantly fracture strength.
- Increased flexural strength.
- Applied to lower tension surface of reinforced concrete beam provides substantial strength improvements.
- Improved lateral compression strength of cylindrical structures.
- Encasement of columns for seismic protection.
- Improves a structures ability to withstand lateral distortion and buckling.

The following concrete structures are typical areas of application: Bridges, Piers, Parking Structures, Tunnels, Silos, Chimneys, Dams, Tanks and Slabs, Beams and Columns etc. in buildings.

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APPLICATION METHOD

1. Surface preparation

Ensure that the concrete surface is clean and sound. Remove all contaminants including coatings, grease, oil, dirt, excessive laitance, salts and unsound material by grinding, hammering, etc. Where necessary degrease with chemical degreaser.

Any structural cracks should be injected with **Guardian CIR** epoxy resin injection material.

*Note:- Unsound deteriorated concrete that occurred as a result of corrosion of rebars, needs to be removed to behind rebar. Corroded rebar to be cleaned with rust remover. Apply **Guardian Zinc Primer** on cleaned rebar as a corrosion protective coating. Apply **Guardian WEAP** as a bonding bridge on the prepared concrete surface. Apply **Guardian 600 Series** over **Guardian WEAP** bonding bridge to bring back the profile of concrete. In the case of porous substrates finish the surface defects such as pinholes with **Guardian FC**.*

2. Priming

Mix part A and part B of **Guardian CF (HP) Impregnation** and apply at 0.2 litre/m² (or) 0.22 kg/m² by roller or brush. The pot life is typically 50-60 minutes primer will dry within 2-6 hrs.

Note: if substrate moisture is >4%, use Floorgard Moisture Barrier as primer. Refer TDS for More info.

3. Mixing

Part A : Part B = 2 : 1 by weight

Mix Part A and B of **Guardian CF (HP) Impregnation** together for at least 3 minutes with a slow speed mixer (max.300 rpm). Avoid aeration while mixing. Mix only the amount that can be used within the pot life. **Guardian CF (HP) Impregnation** should be applied only after 12 hrs minimum curing of **Guardian CF (HP) Impregnation** used as primer.

4. Guardian CF (HP) Fabric Application

- Apply the first layer **Guardian CF (HP) Impregnation** to the concrete substrate with a roller or brush at the coverage rate of 0.65 kg/m²
- Apply the precut **Guardian CF (HP) Fabric** firmly over the **Guardian CF (HP) Impregnation** and remove entrapped air by rolling the surface of **Guardian CF (HP) Fabric** 2-3 times in the direction in which it is being placed. This ensures proper impregnation of the **Guardian CF (HP) Impregnation** into the **Guardian CF (HP) Fabric**.
- After 2-6 hrs @23°C, roller apply a second layer of **Guardian CF (HP) Impregnation** at the coverage rate of 0.25 kg/m² to completely seal the surface of **Guardian CF (HP) Fabric**.

*Note : Rough substrates consume more material. In the case of additional layers of **Guardian CF(HP) Fabric**, the previous applied layer of **Guardian CF(HP) Fabric & Impregnation** should be cured for at least 24 hrs prior to the second layer application.*

- Full cure of the epoxy resin takes 7 days at 23°C at lower temperatures full cure will require longer time.
- Finish with a coating if required such as **Guardian ELASTOSHIELD** (UV resistant 100% acrylic elastomeric coating).

*Note : **Guardian CF (HP) system** should only be applied by specialist applicators who have had training in the installation of this system. Guardian can provide such training & a list of approved applicators.*

Notes on Applications and Limitations

Samples: - Witness samples should be made at site and tested in a laboratory to ensure the material meets the responsible designer's requirement.

The substrate & ambient temperature should be between 8°C and 36°C. The substrate temperature should be at least 3°C above the dew point.

The product should only be used by experienced professionals. In hot or cold conditions precondition the product 24 hours before use.

Protect from rain for 24 hours after application.

Consult a structural engineer for load calculations & design.

A qualified structural engineer must be responsible for designing the works. Care must be taken in selecting suitably experienced and trained contractors. Protect from permanent exposure to direct sunlight moisture & or water.

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PROPERTIES

	Result	Test Method
Roll Length	Flexible	-
Fabric Weight	300 gm/m ²	-
Fabric Width	Flexible	-
Fabric Weave	Unidirectional	-
Tensile Strength	4700 Mpa	ASTM D 3039
Tensile Modulus of Elasticity (min)	240 GPa	ASTM D 3039
Ultimate Rupture Strain (min)	1.7 %	ASTM D 3039
Nominal Thickness (minimum)	0.166 mm	-

STORAGE & SHELF LIFE/CONSUMPTION

First layer on concrete: 0.65 kg/m².
Following layers on **Guardian CF (HP) Fabric CJ30T**: 0.25 kg/m².

PACKAGING

Guardian CF (HP) Fabric CJ30T (300 gm) = 0.5 m x 100 m per roll.
Guardian CF (HP) Fabric CJ30T (300 gm) = 1 m x 100 m per roll.

STORAGE & SHELF LIFE

The shelf life is 24 months from date of manufacture if stored correctly in original undamaged packaging at temperatures between 5oC-36 °C protect from sunlight.

QUALITY ASSURANCE

ISO 9001: 2015 verified by TUV Nord.

HEALTH & SAFETY

Refer to the MSDS available from Guardian

TECHNICAL SERVICE

The Guardian Coating Service Department is available to assist you in the correct use of our products and its resources are at your disposal entirely without obligation.

DISCLAIMER

Performance data is achieved testing in accordance with International Standards. Testing by others may result in different results from those published as a result of external factors such as poor sampling, incorrect mixing, varying temperatures, curing, crushing procedures etc.
Guardian does not take responsibility nor need to defend others testing that does not achieve the published data.
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