



STERLING TechnoFix® CarboRez PP Strip

High Strength Pultruded Carbon fibre reinforced Polymer Plate Structural Strengthening system as part of TechnoFix® CarboRez System.

Description:

TechnoFix® CarboRez PP Strip are pultruded carbon fibre reinforced polymer (CFRP) laminates, designed for strengthening concrete, timber, masonry, steel and fibre reinforced polymer structures. TechnoFix® CarboRez PP Strip /plates are used as externally bonded reinforcement using Sterling® TechnoWrap EP LV & TechnoSeal® EPA (HS) two-part, 100% solids, high strength structural adhesive system epoxy resin based adhesive providing additional strength and stiffness to concrete, masonry, and wood structural elements.

TechnoFix® CarboRez PP Strip provide high tensile strength for flexural reinforcement (plate bonding) of concrete, metal, wood and other construction materials and repair is lightweight, non-corrosive and is much easier to install than steel.

Application Includes:

TechnoFix® CarboRez PP Strip may only be used by experienced professionals. TechnoFix® CarboRez PP Strip are used to improve, increase or repair the performance and resistance of structures for:

Change in Structural System (load variations): <ul style="list-style-type: none"> Load redistribution due to removal of walls or columns. Reinforces slabs for new openings. Increase of live and dead loads. Increase in traffic (dynamic loads). Installation of industrial equipment and machinery. 	Structural Strengthening: <ul style="list-style-type: none"> Increases the live load capacity of floor systems. Increases the flexural strength of reinforced and prestressed girders. Increases the live load capacity and ductility of columns.
Seismic Strengthening: <ul style="list-style-type: none"> Seismic design requirements. Design loading standards change. Change in design approach. Statutory regulations change. Masonry shear wall strengthening. 	Serviceability Improvement: <ul style="list-style-type: none"> Crack control. Deflection and deformation decrease. Steel reinforcement stress reduction.
Structural Repair <ul style="list-style-type: none"> Structure renovation due to aging. Corrosion of reinforcement. Impact damage. Natural disaster damage. 	Damage to Structural Parts: <ul style="list-style-type: none"> Corrects strength deficiency due to deterioration and corrosion Restores flexural strength of structural elements damaged by fire.
After construction changes: <ul style="list-style-type: none"> Openings in structural members. Removal of bearing members. 	Design or Construction Defects: <ul style="list-style-type: none"> Insufficient structural members dimension. Lack of reinforcement steel.

Application Instructions

Substrate Preparation

Substrate preparation Remove from all grease, oil, dust residual curing compound, mould release agent or other contaminants that could impair adhesion. Spalled concrete should be cut back to sound concrete and made good with suitable TechFin®, TechnoCem™ range of repair products.

For concrete laitance should be removed preferably by light sweep blasting or hydro-jetting. Mechanical wire brushing may be appropriate for small areas.

Cutting of Laminates

Laminates can be cut to appropriate length using a reciprocal saw with a fine-tooth blade or a grinder.

Mixing of TechnoSeal® EPA (HS)

To ensure proper mixing, a mechanically powered mixer or drill fitted with a suitable paddle should be used. Stir the base and the hardener individually to disperse any settlement. Entire contents of the base and hardener should be poured into a suitable size container and mixed mechanically for 3 minutes.

Products to use for bonding

Apply Sterling® TechnoWrap EP LV as primer using roller or brush and wait until dry for the adhesive application Installation of TechnoFix® CarboRez PP Strip/ Laminates.

Application of TechnoFix® CarboRez PP Strip/ Laminates

- All pinholes, honeycombs, or surface irregularities on the concrete surface shall be treated and evened out using TechnoSeal® EPA (HS) epoxy putty and leveling compound.
- Use TechnoSeal® EPA (HS) to bond the carbon plates by placing it on the TechnoFix® CarboRez PP Strip/ Laminates after cleaning from the grinded side. Use a spatula for the placement and make sure that sufficient material is placed on the carbon plate.
- Apply a thin layer of TechnoSeal® EPA (HS) on the prepared substrate. Then apply the TechnoFix® CarboRez PP Strip/ Laminates with the TechnoSeal® EPA (HS) onto the substrate. Use a small roller to roll the plate till the excessive adhesive is pushed out from the sides of the plate and remove the excess with a spatula.
- When TechnoFix® CarboRez PP Strip/ Laminates are intersecting, the bottom plate is to be ground in the crossing zone and cleaned prior to the application of the top layer.

Features:

- Non-corrosive reinforcement system
- Used for shear or flexural strengthening
- High strength
- Light weight- very easy to install, especially overhead (without temporary support)
- Reduces crack width
- Alkali resistant
- Low aesthetic impact
- Low system thickness, simple execution of plate intersections or crossings
- Available in several widths and thicknesses supporting ease of design.

TechnoFix® CarboRez PP Strip are available in three grades:

- CarboRez PP Strip HS (high strength)
- CarboRez PP Strip IM (intermediate modulus)
- CarboRez PP Strip HM (high modulus).

The CarboRez PP Strip HS grade is available in thicknesses of 1.2mm (CarboRez PP Strip HS 1200) and 1.4mm (CarboRez PP Strip HS 1400).

The CarboRez PP Strip IM grade is available in thickness of 1.2mm (CarboRez PP Strip IM 1200)

The CarboRez PP Strip HM grade is available in thicknesses of 1.2mm (CarboRez PP Strip HM 1200) and 1.4mm (CarboRez PP Strip HM 1400).

Installation Guidelines

TechnoFix® CarboRez PP Strip/ Laminates can only be applied by *STIPL registered and certify applicator using trained personnel and the correct equipment. *STIPL does not allow any contractor on to the register unless they satisfy strict selection criteria. For each application *STIPL will provide a detailed method statement that the Registered Contractor will work to.

Product Identity			
Matrix Type	epoxy resin		
Reinforcement	high resistance carbon fibres		
Colour	black		
Product Properties			
	CarboRez PP Strip HS	CarboRez PP Strip IM	CarboRez PP Strip HM
Carbon fiber content	>68%	>68%	>68%
Thickness	1.2/1.4mm	1.2mm	1.2/1.4mm
Modulus of elasticity (GPa)	>165	>210	>400
Tensile strength (MPa)	>3000	>2400	>1500
Elongation at Break, %	≥1.7%	≥1.5%	≥1.5%

** Values above are typical mean values obtained from regular testing as per ASTM D-3039. Some variation may occur depending upon the batch size and test method sensitivity. Standard deviation of ± 5% is common. The designer is advised to satisfy himself, by prior testing if necessary, that the grade chosen will perform to the performance criteria as per his design.

Cleaning

Tools and containers may be cleaned using TechnoFix® CleanzolPlus when the adhesive is still fresh. The hardened adhesive can be removed from tools mechanically.

Design Notes

No plastic deformation reserve is allocated to TechnoFix® CarboRez strengthening systems, thus the maximum bending resistance of a strengthened section is reached when plate failure occurs during steel yield and before concrete failure. The mode of failure is influenced by the plate cross section. To limit crack widths and deformation, the yield point should not be reached in the reinforcing bards under service conditions.

Any shear surface and shearing of the laminate. Stress and deformation calculations can be made by the normal methods. They should be verified in accordance with standards SIA 160 (1989) and 162 (1989).

When assessing the condition of the structure; check the dimensions (geometry, reinforcement, evenness of surface to be strengthened), quality of existing construction materials, ambient climatic conditions, and agreed conditions of service.

Verifications to take place are:
Loading Safety- shearing of plates, anchorage, and non-strengthened structure (with allowance for a reduce safety factor
 $\gamma \geq 1.0$

Fatigue Resistance: check on concrete and steel stresses. Serviceability: Deformation with average strains, assuming elastic behavior of the structure and time based strain changes in concrete. Steel stresses (no plastic deformation in service conditions), and crack widths (by limiting the steel stresses under service conditions).

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Standards

TechnoFix® CarboRez PP Strip designs are conducted as per ACI 440, FIB 14, and ISIS # 3, 4, 5.

Packaging

TechnoFix® CarboRez PP Strip are available in 100m rolls in different widths (mm) stating from 50mm to 120mm. Greater than 100 mm widths available on special request with MOQ and lead time.

Storage & Shelf Life

TechnoFix® CarboRez PP Strip should be stored in dry conditions and protected from direct sunlight; the shelf life under such conditions will be 24 months. Store under cover, out of direct sunlight and protect from extremes of temperature. In tropical climates the product must be stored in an air-conditioned environment.

Limitation/Watch points

- Please refer to the relevant Product Data Sheet of TechnoSeal® EPA (HS) - epoxy adhesive.
- A suitably qualified Structural Engineer must be responsible for the design of the strengthening works.
- Additionally as this application is structural, great care must also be taken in selecting suitably experienced and trained specialist contractors. TechnoFix® CarboRez strengthening systems with TechnoFix® CarboRez PP Strip must be protected from permanent exposure to direct sunlight, moisture and/or water. Please refer to the relevant Method Statement and Product Data Sheets for the selection of suitable over coating materials, in situations where systems will be fully or partially exposed.
- During application the temperature must not be below +5°C and the structure must be protected from rain and dust brought by wind. Maintain the treated surfaces at a temperature higher than +5°C after work has been carried.
- Protect the surface from rain for at least 24 hours. If the minimum temperature does not go below +15°C, or for at least 3 days if the temperature should be lower.

Fire

TechnoFix® CarboRez strengthening systems is nonflammable.

Additional Information: Techno Builders Solutions® By Sterling Technotrade India Pvt.Ltd -The Specialist Construction Chemicals Company® range of associated products includes high performance concrete Admixtures, Adhesives, Protective Coatings, Concrete Repairs, Industrial Flooring, Grouts & Anchors, Joint Sealants, Surface Treatments, curing compounds, repair mortars, release agents, Grinding Aids & Waterproofing.

*Separate datasheet are available on these products.

Health and Safety instructions

Protect your health while working with this material, always use safety goggles, gloves and safety clothing. When handling hazardous materials or pressurized materials, or during any application that may result in spills, splashes or airborne particles, a full face shield is strongly recommended. Protect yourself and others on the jobsite. Consider property in proximity of the application area to prevent loss or damage. Protect your jobsite from unauthorized persons. Store all materials and equipment safely and out of reach of children and animals.

Observe container labels, SDS, applicable laws and regulations and all instructions before using the product and equipment. In case one of the components comes in contact with the skin, wash thoroughly with soap and water. Provide adequate ventilation in volume and pattern in working area.

DISCLAIMER: The product information & application details given by the company & its agents has been provided in good faith & meant to serve only as a general guideline during usage. Users are advised to carry out tests & take trials to ensure on the suitability of products meeting their requirement prior to full scale usage of our products. Since the correct identification of the problems, quality of other materials used and the on-site workmanship are factors beyond our control, there are no expressed or implied guarantee / warranty as to the results obtained. The company does not assume any liability or consequential damage for unsatisfactory results, arising from the use of our products.

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Please note that this datasheet supersedes all previous versions.