



12.03 XPERT PROFIBRE CP SYSTEM

Heavy Duty Carbon Fiber Reinforced Polymer (CFRP) Plate/Strip

PRODUCT DESCRIPTION

Heavy duty structural strengthening system based on carbon fibers, the XPERT PROFIBER CP SYSTEM series is a number of products based on CFRP plates for use with reinforced concrete, masonry, stonework, aluminum and timber. The system is composed of CFRP plates and an epoxy adhesive to bond reinforcement.

APPLICATIONS

To strengthen structures for:

1. **Structure use change (load variations):**
 - Increase of live and dead loads.
 - Increase in traffic (dynamic loads).
 - Installation of industrial equipment and machinery.
2. **Design or Construction Defects:**
 - Insufficient structural members dimension.
 - Lack of reinforcement steel.
3. **Standards and Specifications Regulatory change:**
 - Seismic design requirements.
 - Design loading standards change.
 - Change in design approach.
 - Statutory regulations change.
4. **Serviceability Improvement:**
 - Crack control.
 - Deflection and deformation decrease.
 - Steel reinforcement stress reduction.
5. **Structural Repair:**
 - Structure renovation due to aging.
 - Corrosion of reinforcement.
 - Impact damage.
 - Natural disaster damage.
6. **After construction changes:**
 - Openings in structural members.
 - Removal of bearing members.

STANDARDS XPERT PROFIBER CP designs are conducted as per ACI 440, FIB 14, and ISIS # 3, 4, 5.

TECHNICAL PROPERTIES

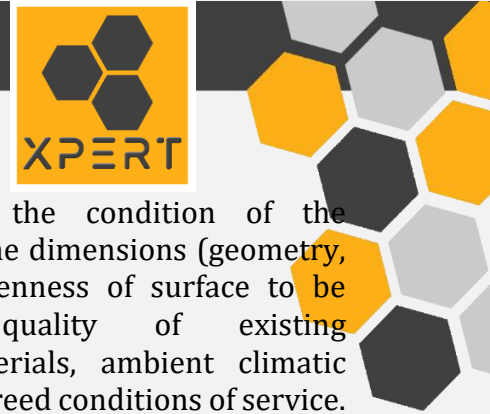
XPERT PROFIBER CP 120 / 140 Series: High strength carbon plate/laminate.

- Color: **Black**
- Fibre Volumetric content: **> 68%**

CATEGORY	XPERT CP-100 Series	XPERT CP-200 Series
E-Modulus	165 GPa	210 GPa
Tensile strength: (Minimum)	3000 MPa	2400 MPa
Mean value of tensile strength	3050 MPa	2900 MPa
Elongation at break	1.7%	1.2%

Technical Properties: XPERT PASTE EPOXY

CATEGORY	PARAMETERS
Appearance	Thick Grey Paste
Compressive strength: ASTM D695	≥ 70 MPa @ 7 days
E-Modulus (compression): ASTM D695	≥ 12000 MPa @ 7 days
Tensile strength: ASTM D638	≥ 27 MPa @ 7 days
Adhesive strength: ASTM D4541	≥ 3.5 MPa (Concrete Failure)
Pot life (F.I.P.)	50 - 70 min @25°C
Mixing ratio	1:1 (Base: hardener)
Slant shear bond strength: AASHTO T-237-73	≥ 25 MPa (Old / New Concrete)
Heat deflection: ASTM D648	≥ 50°C



PACKAGING

XPERT PROFIBER CP plates come in rolls of 100mtr lengths:

XPERT PROFIBRE CP – 120:

Thickness: 1.2mm, **Width:** 50mm/100mm

XPERT PROFIBRE CP – 140:

Thickness: 1.4mm, **Width:** 50mm/100mm

XPERT PASTE EPOXY is packaged in twin component packs of 05-kg.

ADVANTAGES

- Ease of installation – cost effective.
- Preservation of space management (thin dimensions).
- Ease of jointing and forming.
- Ease of transportation.
- Available in a number of properties supporting ease of design.

DIRECTIONS OF USE

Design Notes: No plastic deformation reserve is allocated to XPERT PROFIBER CP system; 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).

Substrate Preparation: All substrates shall be free from oil, grease or any contaminants. It is recommended to blast clean substrates and clean all debris or dust. The substrate should be even and checked with a flat metal edge, the tolerance accepted shall not exceed 10mm in a 2mtr length.

Mixing of XPERT PASTE EPOXY: 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. Ensure contents of the base and hardener should be poured into a suitable size container and mixed mechanically for 3 minutes.

Application of XPERT Profiber Carbon Plates

All pinholes, honeycombs, or surface irregularities on the concrete surface shall be treated and evened out using XPERT PASTE EPOXY, (epoxy putty and leveling compound). Use XPERT PASTE EPOXY to



bond the carbon plates by placing it on the XPERT PROFIBER carbon plate 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 XPERT PASTE EPOXY on the prepared substrate. Then apply the fiber plate with the XPERT PASTE EPOXY 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 XPERT PROFIBER plates are intersecting, the bottom plate is to be ground in the crossing zone and cleaned prior to the application of the top layer.

Storage: XPERT PROFIBER CP plates have an unlimited shelf life, if stored away from UV light.

XPERT PASTE EPOXY has a shelf life of 12 months when stored in a shaded cooled area.

WARRANTY

This product is warranted to be free of defects in material and workmanship, and conform to XPERT Construction Chemicals ("XPERT") quality control standards. All recommendations, statements and technical data herein are based on tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty or guaranty of any kind, expressed or implied including but not limited to, an implied warranty of merchantability or an implied warranty of fitness for a particular purpose.

Satisfactory results depend upon many factors beyond XPERT's control. User shall rely on his or her own information and tests to determine suitability of the product for the intended use and user assumes all risk, loss, damage, expense and liability resulting

from his or her direct use, indirect use or consequential to their use of the product.

- XPERT shall not be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use or inability to use the product.
- XPERT's sole responsibility shall be to replace that portion of the product, which proves to be defective.
- Any warranty claim must be made within six (6) months from the date of the claimed breach.
- This limited warranty applies only if the product was properly installed and used according to all instructions.
- This limited warranty applies only if the was properly stored prior to use.