



## TCI PrecurStrong Carbon Fibre

### PRODUCT DESCRIPTION

TCI PrecurStrong is a unidirectional, high-strength, high-modulus carbon fibre-reinforced polymer (CFRP) strip for structural strengthening. It is bonded onto the structure as external reinforcement using TCI 400-SA, an adhesive epoxy.

### APPLICATIONS

#### Structural capacity changes

- Increased live and/or dead loads in structures
- Increased traffic volumes on bridges and viaducts
- Allows for the removal of walls, columns, or sections of floor slabs
- Ability to accommodate changes of building utilization or industrial machinery layout

#### STRUCTURES

- Buildings, Bridges, Parking garages, Chimneys, Piers/wharfs, Tunnels, Pipes

#### ELEMENTS

- Columns, Beams, Slabs, Walls, Piles, Pier caps

#### GENERAL

- Seismic Retrofit, Damage Repair, Load Rating Upgrade, Defect Remediation, Blast Mitigation

### ADVANTAGES

- Meets design criteria of **ACI 440**, and **CSA S806**
- High strength-to-weight ratio
- Light weight, adds negligible dead load to structure
- Non-corrosive, non-magnetic and non-conductive.

### TCI 400-SA, Adhesive Epoxy

TCI 400-SA is a two-component, 100% solid, room temperature curing thermoset epoxy system with low viscosity and long pot life characteristics.

|  |   |                  |
|--|---|------------------|
| Specific Gravity @ 23oC, g/cm <sup>3</sup> | 1.54 +/- 0.04                                 | 1.08 +/- 0.04    |
| Viscosity @ 23oC, cps                      | Paste   | 40,000 +/-10,000 |
| Mix Ratio by weight                        | 100   | 25               |
| Pot Life @ 23oC, 200gm mass                | 1.0-1.25 hours                                |                  |
| Gel Time @ 23oC, 200gm mass                | 1.45-2.45 hours                               |                  |
| Cure Cycle                                 | 3 Days @ R. T. OR 6 Hrs @ 45oC + 24Hrs@ R. T. |                  |

### MECHANICAL & PHYSICAL PROPERTIES

| TCI PrecurStrong Carbon Fibre |   |
|-------------------------------|---|
| PHYSICAL PROPERTIES           | TYPICAL TEST VALUE                              |
| Tensile Strength              | 400 Ksi (2,758 MPa)                             |
| Tensile Modulus               | 24 Msi (165.474 GPa)                            |
| Elongation at Break           | 1.70%   |
| Fibre Volume Content          | > 68%   |
| Temperature Resistance        | 300 F (149 C)                                   |
| Thickness                     | 0.0472 " (1.2mm)                                |
| Standard width                | 1.97", 3.15", and 3.94"<br>(50, 80, and 100 mm) |

| TCI 400-SA – Cured 24 Hrs @ 60°C |                        |
|----------------------------------|------------------------|
| TYPICAL TEST PROPERTIES          | TYPICAL TEST VALUE     |
| Tensile Strength                 | 10,050 psi (69.3 MPa)  |
| Tensile Modulus                  | 406 Ksi (2,800 MPa)    |
| Elongation at Break              | 7.5%                   |
| Flexural Strength                | 16,900 psi (116.5 MPa) |
| Flexural Modulus                 | 478 Ksi (3,296 MPa)    |
| Glass Transition Temperature Tg  | 94°C (201°C)           |



## INSTALLATION

### Environmental conditions

- Maintain a dry dehumidified environment and maintain the ambient temperature at a minimum of 10° F above the dew point.
- Substrate surfaces shall be at least at SSD (Saturated Surface Dry) condition prior to installation.
- Maintain the required environmental conditions of substrate surfaces until at least 48 hours after the installation has been completed.
- The surface temperature of the substrate shall not fall below 5° C. Don't apply the protective coating if the substrate surface temperature is above 40° C.

### Surface preparation:

- Concrete substrate must be sound and clean. Remove all spalled or fractured areas and inject any cracks that exceed 0.3 mm in width. Ensure to patch and fill voids.
- All surfaces must be free of dust, laitance, grease, waxes, coating materials, and any other foreign particles.
- Surface preparation should promote continuous intimate contact between the CFRP system and the substrate surface.
- Substrate surfaces shall be thoroughly cleaned using mechanical and/or high-pressure sand /water blasting.

### Surface-Mounted Applications:

Apply the pasted laminate before the filler paste has cured. Cut TCI PrecurStrong to appropriate lengths using a metal cutting wheel and clean with solvent to remove all contaminants. Proper personal protective equipment should be worn when performing any cutting. Apply TCI 400-SA adhesive epoxy to the laminate using a paste profiler or trowel to form a curved cross sectional profile with paste thickness of approximately 3 mm (1/8 in.) at the middle and 1 mm (1/16 in.) at the edges. Install the laminates with the paste side against the substrate and remove entrapped air using hand pressure, rollers or trowels until paste emission becomes present. Allow TCI 400-SA to fully cure and lightly sand adhesive epoxy and laminate before applying Corotech Waterborne Acrylic Urethane (or equivalent) as the finish coating. Take care to avoid damaging carbon fibre during sanding.

### Near-Surface-Mounted (NSM) Applications:

Saw-cut a slot into the substrate per approved shop drawings. When using TCI PrecurStrong, fill entire slot with the adhesive epoxy (TCI 400-SA), ensuring that the slot is full of paste with no air bubbles present. Place the TCI PrecurStrong Carbon Fibre Strips oriented vertically into the slot and remove the excess paste. When using the TCI 400-SA, fill approximately 2/3 of slot with the epoxy saturant. Place the TCI PrecurStrong Carbon Fibre Strips oriented vertically into the slot and add additional adhesive epoxy to fill the slot, if necessary.

### Installation of PrecureStrong Carbon Fibre Strips:

1. Setting out according to design;
2. Remove painting of the concrete surface and polish, blow out the floating dust with compressed air;
3. Prepare adhesive: Mix component A and B evenly in bucket. Mix ratio by weight A: B = 2:1 ;
4. Installing: Paste TCI 400-SA onto the surface of carbon fibre plate evenly, ensure to avoid bubbles;
5. Anchorage: Paste the carbon fibre strip onto the concrete surface, remove extra epoxy near the plate.
6. Maintenance: Cure time should be no less than 24 hours at room temperature.



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## LIMITED WARRANTY

Ten (10) year material replacement warranty is available. For complete details contact [support@tcicarbonfibre.com](mailto:support@tcicarbonfibre.com). Copy is furnished upon request.

### Legal Disclaimer

Keep products containers tightly closed, keep products out of reach of children, products are not for internal consumption, products are for industrial use only, products are for professional use only. IN CASE OF EMERGENCY: Call CANUTEC +1 (613) 996-6666. Prior to each use of any product of Technical Construction Infrastructure Inc.

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