

PRODUCT NAME

Gem-Strip™ CF

Carbon Fiber Composite

MANUFACTURER

Gemite® Products Inc.

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FEATURES

- High modulus of elasticity
- Very high tensile strength
- Excellent fatigue resistance
- Easy application - vertical or overhead
- Lightweight
- Non-corrosive
- Nontoxic
- Resistant to alkalinity of concrete substrates
- Easy to use
- Simple laminate intersections and crossings

PRODUCT DESCRIPTION

Basic Use

Gemite *Gem-Strip CF Composites* are used in the following applications:

Load increase

- Elevated reinforced floor concrete slabs of industrial and commercial structures
- Bridge structures
- Reinforcement of panelized reinforced concrete buildings
- Reinforcement of structures exposed to vibrations
- Reinforcement of structures due to changes in utilization of structures

Repair of deteriorated structural components

- Reduction in strength of construction components and materials
- Vehicular impact
- Reduction in strength due to corrosion of reinforcing steel
- Repair to structural fire damage

Performance improvement - serviceability, maintenance

- Deflection reduction
- Stress reduction in reinforcing steel
- Crack width and crack opening reduction

Design or construction defects

- Inadequate structural design
- Insufficient reinforcement



Composition and Materials

Gem-Strip CF are high strength carbon fiber - epoxy polymer composites designed for reinforcement of concrete, masonry and timbre structures. *Gem-Strip CF* composites are bonded to structures using *Gem-Cote S ST Adhesive*.

Limitations

Structural calculations and designs must be carried out by an independent and certified professional engineer. The design guide lines are available form Gemite Products Inc.

Health and Safety

Gem-Strip CF material is nontoxic, fully cured and non-reactive. Your skin might be sensitive to “carbon dust” present on the surface of the material. We recommend the use of rubber gloves when handling *Gem-Strip CF* composites. Keep product out of reach of children. FOR INDUSTRIAL USE ONLY.

Color

Black.

Packaging

Gem-Strip CF composites are available in rolls 100 meters (328 linear ft) long. Longer custom lengths are available. *Gem-Cote S ST Adhesive* is supplied in 12 kg (26.4 lbs) container (Component A) and 4 kg (8.8 lbs) container (Component B).

Storage

Gem-Strip CF composites, stored in pallets in a dry, cool area, have unlimited shelf-life. Do not expose composites to direct sun light in the storage area.

TECHNICAL DATA

Gem-Strip CF Composites

Ultimate Tensile Strength ASTM D3039	> 3,000 MPa	4.35*10 ⁵ psi
Design Tensile Strength	2,800 MPa	4.06*10 ⁵ psi
E-Modulus ASTM D3039	>165 GPa	23.9*10 ⁶ psi
Design E-Modulus	160 GPa	23.2*10 ⁶ psi
Ultimate Strain ASTM D3039	>1.8 %	
Design Strain	0.85 %	
Thickness	>1.2 mm	48 mils
Width		
Gem-Strip CF - 0512	50 mm	1.97 in
Gem-Strip CF - 0812	80 mm	3.14 in
Gem-Strip CF - 1012	100 mm	3.93 in

Gem-Cote S ST Adhesive

Specific Density (Comp. A)	1.62 g/cm ³	101.1 lbs/ft ³
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032000 Concrete Reinforcement
032400 Fibrous Reinforcement

Specific Density (Comp. B)	1.66 g/cm ³	103.6 lbs/ft ³
Pot Life	50 minutes min.	
Tensile Strength	>30.0 MPa	>4,350 psi
Adhesive Strength	>3.5 MPa	>510 psi
Compressive Strength	> 60 MPa	>8,700 psi
Static Modulus of Elasticity	1.2x10 ³ MPa	1.74x10 ⁶ psi
Shear Strength by Tensile Loading (Metal to Metal)	>13 MPa	1,880 psi
Base Resin to Hardener Ratio	2:1	

INSTALLATION

Concrete Repair

The structure may require a repair prior to the application of *Gem-Strip CF* composite. Use *Fibre-Prime* as corrosion protective coating for steel reinforcement and as a bonding agent for *Fibre-Patch OV* repair mortar. See respective Gemite product data sheets for *Fibre-Prime* and *Fibre-Patch OV*.

Surface Preparation

Clean contact surfaces of oil, grease, scale, dirt and other foreign matter. The surface must be clean, sound, dry and free of frost. The concrete structure may require restoration prior to bonding of *Gem-Strips CF*. Remove all deteriorated concrete, sand blast the surface or clean using an approved method. (Contact Gemite Technical Service for further instructions). The tensile strength of the concrete must be checked by a random pull-off test (ACI 503R) at the discretion of the engineer. Minimum tensile strength must be 1.4 MPa (200 psi) with failure in the substrate concrete. Uneven surfaces must be filled with and epoxy mortar made of 1:1 volume parts of *Gem-Cote S ST Adhesive* and oven-dry silica sand. Maximum allowable deviation is 6 mm (1/4 in) in 3 m (6 ft) and not greater than 3 mm (1/8 in) over 1 m (3 ft). Remove any sharp edges by grinding. The maximum surface roughness "peak and valley" must not be more than 1 mm (40 mils). When using the epoxy mortar for leveling, "sand" the surface and remove dust. The concrete surface must be ground to expose aggregates and dust completely removed.

Cutting Strips

Use "grinding - abrasion" or "guillotine" type cutting tools and support both sides of the strips to avoid splintering. Clean the surface of the strips with MEK and let dry.

Application

Mix *Gem-Cote S ST Adhesive* with the mixing ratio of 2:1, Component A (Resin) : Component B (hardener), using a slow electrical drill (no more than 600 rpm) and a paddle. Apply the *Gem-Cote S ST Adhesive* on to the surface of concrete at thickness of 1.5 mm (60 mils) using a "straight" rubber spatula. Apply the same adhesive to the surface of *Gem-Strip CF* using a "roof shaped" spatula to thickness approximately 1.5 mm. The total coverage is: CF-0512 0.3 kg/lin.m.; CF-0812 0.5 kg/lin.m.; CF-1012 0.6 kg/lin.m.. The "open time" of the adhesive is approximately 50 minutes, the setting time approximately 8 hours at 25°C.

Strip Installation

Within the open time of the epoxy, place the *Gem-Strip CF* composite onto the concrete surface. Using a hard rubber roller, press the strip into the epoxy resin on concrete until the adhesive is forced out on both sides. Remove excess adhesive. The adhesive thickness should not exceed 3 mm (1/8 in). The entire *Gem-Strip CF* reinforcing system must be protected by *Primer # 300* and *Tuff-Flex CA*. Please consult respective Gemite product data sheets.

AVAILABILITY AND COST

Gem-Strip CF composites are available worldwide. Contact Gemite Products Inc. for the name of the Representative/Distributor nearest you and pricing information. Use reasonable care in transportation.

MAINTENANCE

None required.

WARRANTY

A limited, twelve (12) months, Material Replacement Warranty is available. Contact Gemite Technical Service for further information.

Short Specification

The reinforcement will be *Gem-Strip CF*, a carbon fiber-epoxy composite, (CF-0512, CF-0812, CF-1012 - specify the strip type), manufactured by Gemite Products Inc. [USA 888-443-6483], [Canada 905-672-2020]. It will be applied according to manufacturer's specifications and recommendations. Contact Gemite Products Inc., or a local Representative for specification assistance and application instructions.