GATEWAY COMPOSITES LLC

Composite Strengthening Systems

CFRP strengthening systems should be installed by contractors experienced with doing concrete and masonry repairs, surface preparation, and the application of composite reinforcements and coatings.

Storage

Fabrics should be kept boxed or bagged and away from direct sunlight, moisture, dirt and dust.

Safety

Review Safety Data Sheets (SDS) for all raw materials prior to use. Always wear personal protection equipment. Perform work in a well ventilated area. Wear particle masks or NIOSH respirator if the work area is not well ventilated. Wear safety glasses to protect eyes from possible irritation. Wear gloves to protect hands from possible irritation. Use caution when handling or working with carbon fiber around electrical equipment as carbon fibers are electrically conductive.

Design

Design calculations shall be made by a licensed professional engineer. Design should comply with ACI 440.2R.

Surface Preparation

The surface must be dry, clean, free from paint, waxes, grease, dust, oil or dirt and free from frost. For bumps, fins and protrusions use hammer, sand blasting, pressure washing, shot blasting, grinding or other approved mechanical means to achieve an open-pore texture with a CSP (concrete surface profile) 3 or better. Round corners to a minimum ½" radius where the fabric will be wrapped. Surface should be wiped with clean cloth after grinding, blasting, brushing surface to remove dust particles.

Uneven surfaces (voids) and mortar joints must be filled with appropriate filler compound (Gateway 777 Epoxy Filler Compound). Filler Compound should be pressed into the voids/cracks and feathered for smooth surface. A smooth surface is critical for fabric bonding. Uneven surface can result in voids between fabric and substrate which leads to delamination of composite.

The adhesive strength of the concrete may be verified after surface preparation by random pull-off testing (ACI 440.3R or ASTM D4541) at the discretion of the engineer. Minimum tensile strength of 200 psi must be achieved.

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Application

Review the specified number of plies and fiber orientation per the engineer's design.

Fabric should be cut to appropriate lengths with a utility knife or high quality commercial grade textile scissors/shears. Do not fold or crease fabric. Keep the fabric free of dust, oils, moisture, and other contaminates at all times.

Mix primer and saturant resin components using recommended procedures from resin manufacturer(s). If specified, apply primer resin to surface.

Using a medium nap roller, apply approximately a 20 mil wet film thickness of saturant resin to the surface to be strengthened. Apply the Gateway Composites carbon fiber fabric onto the uncured saturant. Use a rib roller in the direction of the fibers to enable complete impregnation of the fabrics fibers and release of air bubbles as seen by uncured saturant resin "bleeding" through the fabric. Apply a second 20-30 mil coat of saturant resin over the fabric and use nap roller for complete fabric impregnation of resin and removal of air bubbles. Repeat this step for additional plies.

If a topcoat is specified for chemical, thermal or abrasion resistance, refer to manufacturers procedure for mixing and application guidelines.

Limitations

- Design calculations must be made by a licensed professional engineer.
- Do not apply to concrete less than 30 days old.
- Do not apply to concrete less than 50°F.
- System is a vapor barrier.

Disposal

Dispose of in accordance with local disposal regulations.

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UD300 Unidirectional Carbon 300g/m² – 9oz/yd²

GCCF12KUNI300 is a unidirectional, high strength, non corrosive carbon fiber fabric oriented in the 0° direction. The fabric is field laminated with a resin system to create a carbon fiber reinforced polymer (CFRP) system to reinforce structures such as buildings, parking garages, tanks, pipes, bridges, stacks and piering including walls (poured and masonry), columns, beams, slabs and pile elements.

Product ID:	GCCF12KUNI300-12, 24
Description:	12K Carbon Warp Uni, 300g/m² nominal
Raw Material:	Warp - 12K Carbon Fiber Fill - Hot Melt Polyester
Weave:	Unidirectional
Fiber Distribution:	95% Warp / 5% Fill
Weight:	300 g/m² (±15g/m²) 9 oz/yd² (± 0.5 oz/yd²)
Std. Width:	12, 24, 50 inch (±0.25 inch)
Edge Type:	Leno @ Selvedge
Std. Roll Size:	100 yards

PROPERTIES

Carbon Fiber Properties (Lot Average)

	English	Metric
Tensile Strength	720 ksi	≥4963 MPa
Tensile Modulus	≥34 msi	≥234 GPa

Cured Laminate Properties

Tensile Strength (ASTM D3039)	203,000 psi	1400 MPa
Tensile Modulus (ASTM D3039)	13,700 ksi	95 GPa
Elongation at Break (ASTM D3039)	1.3%	
Thickness (ASTM D3039)	.02 in	0.51 mm

"Carbon Fiber Properties" are confirmed by Certificate from the fiber manufacturer. "Cured Laminate Properties" are typical. The properties do not constitute any warranty or guarantee. All values are for material selection purposes only. The customer must determine suitability of any information or material for any contemplated use and assumes all risk. This information is for use by technically skilled persons at their own discretion and risk.

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747 Epoxy Resin

Gateway Composites 747 is a two-component, high strength, high modulus epoxy resin system used as the primer and saturant for Gateway Composites carbon fiber systems and kits (FIBERLOCK™ and private label brands). 747 Resin is combined with carbon, glass and basalt fabrics for wet-layup composites providing strengthening and reinforcement to structural members.

APPLICATIONS

Corrosion Repair	Load Upgrade
Blast Mitigation	Seismic Retrofit
Crack Repair	Marine Repair

FEATURES

VOC Compliant	Ambient Cure
Superior Fabric Wet-Out	Solvent Free
Superior Bond Strength	Pot Life Choice

SUBSTRATES

Concrete | Masonry | Wood | Steel

STRUCTURES

Tanks	Bridges	Parking Garage
Buildings	Tunnels	Silos
Piers/Pilings	Precast	Cell Towers
Foundation Walls	Patios	Driveways

PACKAGING & MIX RATIO

Part A Base Resin - 3:1	Part B Hardener - 1:3
1 US Gal Jug 5 US Gal Pail	43 oz Jug 1 US Gal Jug

SHELF LIFE & STORAGE

2 years in unopened container

Store in a cool dry place at 50-90ºF.
Condition to 70-80ºF for 24 hours prior to use.

MATERIAL PROPERTIES

Color:	1
Viscosity:	400-500 cps
Pot Life - Standard Part B:	30 minutes
Pot Life - Long Part B:	60 minutes

CURED EPOXY PROPERTIES

Tensile Strength:	11,200 psi
Tensile Modulus:	470,000 psi
Flexible Strength:	13,700 psi
Flexible Modulus:	530,000 psi
Elongation:	2.7%

Preparation & Handling

- Always prepare surface prior to application. Surface must be clean, free of protrusions and voids for optimal bonding.
- Mix no more resin than can be applied within the work period.
- Apply when ambient temperature is 45-95°F.

Safety

- Keep resin away from direct sunlight, flame or other hazards.
- Part "A" may cause eye/and or skin irritation.
- Part "B" is corrosive. Severe irritation to eyes, throat and skin.
- Wear protective gloves/clothing/eye and face protection. Do not breathe vapors. Keep off skin and out of eyes. Keep container closed when not in use. Use only with adequate ventilation. Wash thoroughly after handling.
- Review SDS for First Aid information.
- Spills and Leaks: Collect using non-reactive absorbent and place in sealable container for proper disposal.
- Resin creates vapor barrier after cure.

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