

CARBON FIBER WALL BRACING SYSTEM CB-WBK-8

Carbonbond is a dry noncorrosive carbon fiber fabric constructed with high strength carbon fibers. Carbonbond, in conjunction with Carbonbond saturates are used to increase the tensile strength on the inside face of the bowing walls, counteracting external soil pressure. Wall Brace Carbon Fabric is available in 12-inch-wide unidirectional construction.

KIT CONTENTS

- Unidirectional Carbon Fiber (8 sheets, 12-inch-wide by 90-inch-long; designed to cover 8 straps)
- 747 Epoxy Resin Part A Base (128 oz, 3:1 Mix)
- 747 Epoxy Resin Part B Hardner (43 oz, 1:3 Mix)
- Paint Stirrers (2)
- Roller Frame (1)
- Roller Covers (4)
- Gloves (4 pair)
- Poly Drop Cloths (2 - 4-feet by 10-feet)
- Measuring Bucket (1)

STORAGE

Keep Carbonbond resin components tightly sealed in their original containers until ready for use. Store at 60-80°F to facilitate handling and workability. Properly stored, Carbonbond resin has a shelf life of 12 months. All resins should be conditioned to 70-75°F prior to use for best viscosity, application and wet out capability. Fabrics should be kept boxed or bagged and away from direct sunlight, moisture or dirt/dust.

TYPICAL PROPERTIES

Reinforcement	Unidirectional Carbon Fiber Fabric
Color	Black
Dry Fiber Tensile Strength	>720 ksi Certified
Dry Fiber Tensile Modulus	>34 msi Certified
Laminate Tensile Strength	200 ksi
Laminate Tensile Modulus	13.7 msi
Laminate Thickness	0.02 inch

SURFACE PREPARATION

Concrete should be a minimum 50°F, adequately cured, possess adequate integrity and not be expelling excess water or hydration. A rule of thumb for cure of new concrete is 28 days cure at 70°F but that is not an assurance that the concrete has achieved adequate physical properties. The prepared area should extend



2-inches (on all sides) beyond the width of the carbon fabric. In general, the surface must be dry, clean, free from dust, paint, coating, 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 per ICI Guideline 310.2R. 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 CFFC-64 Filler Compound (2 part 1:1 mix ratio).

RESIN MIXING

747 Carbonbond Resin is a two part epoxy system with a mix ratio of 3:1 (3 parts base epoxy, 1 part hardener). Epoxies generate heat during mixing and curing cycle, components must be mixed accurately and completely. Use a measured mixing container and roller pan with a high surface to volume ratio that will help minimize heat generation. Mix and keep resins from direct sunlight. Mix using a paint stirrer, avoid plunging it up and down in the bucket. This can fold air into the resin, which may cause bubbles to form in the coating after it has been applied. Be especially careful not to allow water to enter the mix. The working time for Carbonbond resin is 25-30 minutes at 70°F, mix only necessary amount to be applied within 30 minutes (15 oz. base part A and 5 oz. Hardener Part B for 8-ft of carbon fiber application). Working time will be longer at cooler temperatures and will be much shorter at higher temperatures.

APPLICATION

Apply one coat of mixed Carbon fiber resin to saturate and cover concrete (approx. 20 mil thickness) with 1/4" nap roller. Make sure to cover complete application area (no dry concrete visible where carbon fiber will be applied, press roller firmly onto surface for good coverage). Place cut fabric piece against wall so fiber orientation is from top to bottom (vertical). Use hands to gently press fabric into resin for adhesion. Apply second coat of resin extending beyond dimensions of carbon fabric by 2 inches. Press firmly with roller keeping in same direction as fibers for maximum saturation and wet-out of fabric.

SAFETY AND FIRST AID

Avoid breathing vapors. Avoid contact with skin and eyes. Rubber gloves, mask, and goggles are recommended for safety. Review safety data sheets (SDS) prior to use.

RECOMMENDED TOOLS

- Respirator (NIOSH/MSHA Approved)
- Grinder with 5-inch diamond grinding wheel
- Power drill
- Goggles and face shield
- Disposable paint tray
- Scissors
- Tape Measure

STEP BY STEP INSTRUCTIONS

1. Locate and mark the positions of the wall strips by placing a mark 2-feet from each end of the wall and measuring inward mark every 4-feet center. *For a cleaner and professional finish look, measure 8-inches from each side of center mark for 12-inch wide carbon fabric and 4-inches wide for 6-inch wide carbon fabric. Apply painters tape from top to bottom at each mark which can be removed at end of step 8 for cleanliness.
2. Using a grinder with 5-inch diamond wheel, grind area where the wall strips are to be placed. Remove any protrusions with a grinder or hammer. Brush area removing all debris, paint, coating, oil, and dirt. Make sure the wall is dry.
3. Measure from the top of the wall to the bottom and cut across the width of the carbon fiber so each wall strip measures identical length needed. Cut the number of wall strips needed for the horizontal crack and place near working area.



4. As necessary, fill all cracks, joints and voids, where the wall strips will be placed, using CFFC-64 filler compound. Feather/trowel for smooth surface. A smooth surface is critical for proper adhesion. Voids or bumps will create voids which result in poor bonding of composite to structure.
5. Mix 15 oz. "747 Part A Epoxy" with 5 oz. "747 Part B Hardener" in a dry clean disposable bucket. Mix thoroughly. Pour resin/hardener mixture into a disposable paint roller tray.
6. With a 1/4-inch nap roller, start at the top of the wall and apply resin/hardener mixture to the area where the wall strip will be placed. Apply resin to area 2-inches wider on all sides than the fabric width. Use painters tape as edge guide.
7. With the carbon fiber wall strips at a 90-degree angle across the horizontal crack, lay the wall strip from the top to the bottom. Wearing rubber gloves on your hands, start at the top of the wall strip and slide hands down the wall strip using pressure. This will adhere the wall strip to the resin coated concrete.
8. Rolling in the same direction as the carbon fiber wall strip, apply one more coat of the resin/hardener mixture with roller in the same direction as the fiber (this aids in fabric wet-out). Do not roll back and forth across the fiber direction. Make sure the carbon fiber wall strips are laying flat against the concrete. Use firm pressure to achieve good wet-out of carbon fabric. Remove painters tape.
9. Repeat steps 5 through 8 until the wall has been covered with the carbon fiber wall strips needed.
10. Clean up and dispose of excess materials as stated in the SDS sheets.

*4 foot center is a typical recommendation. Individual wall characteristics (thickness, cracking, deflection, etc.) can influence spacing and should be used by a licensed engineer to calculate spacing per ACI 440 guidelines for optimum results.

INSTALLING COMPOSITE ANGLE BRACKETS, CBCA-4-4-12

Once you have completed installation of the carbon fiber wall straps center of two joists, you are ready to install the upper composite angle brackets.

1. Place bracket over the carbon fiber strap and against the joist. Mark two holes on each side in the center of joist.
2. Remove bracket and drill the four holes you marked with a 1/4-inch drill bit. Note: When drilling the bracket it is important not to add much pressure while drilling. The composite material will create friction and burn out your bit.
3. Place bracket back over the carbon fiber strap and against the two-joists centering your drilled holes on joist. Once centered, screw in the lag screws. Note: We recommend using a #14 x 4-inch timberlock lag screw with a 5/16 hex head. This lag screw hariness for shear is equivalent to a 1/2-inch bolt.

It is the responsibility of each purchaser and end user of each Carbonbond product to determine the suitability of the product for its intended use. Prior to using any product, consult a qualified design professional for advice regarding the suitability and use and application of the product, including whether the capacity of any structural element may be impacted by a repair. "Dry Fiber Properties" are confirmed by certificate from the fiber manufacturer. "Laminate Properties" are to be used by technically skilled persons at their own discretion and risk. The properties do not constitute any warranty or guarantee. AJI values are for material selection purposes only. An externally applied CFRP system is a vapor barrier. Consult with a licensed, professional engineer to evaluate the results of encapsulating a porous substrate, and the installer must read, understand and follow all written instructions, and warnings contained on the product label(s), product data sheet(s), safety data sheet(s) prior to use. For use only by qualified applicators.

