



ICC# ESR-3815

21 Tow Carbon Fiber/Kevlar®
ReGrid Strap with Adhesive Riveting for
concrete structural reinforcement

Product Description: The ReGrid strap by Fortress is a pre-impregnated, 21 tow unidirectional carbon fiber strap with a transverse Kevlar® cross thread creating an open grid, void free externally bonded system. ReGrid straps are for used for strengthening concrete, timber, and masonry structures. ReGrid straps are installed using Fortress Xtreme 4000 or Xtreme 4070 epoxy to form an ICC approved Carbon Fiber Reinforced Polymer (CFRP) system.

PRODUCT USE

Target Applications

- Increased Strength of masonry & concrete walls
- Structural retrofit & upgrades
- Changes in building use with increased load requirements
- Increase strength of parking decks and slab floors
- Reinforcement of compromised steel
- Seismic retrofits
- Shear / Flexural strength improvements
- Addition of heavy or vibrating machinery

Repair Applications

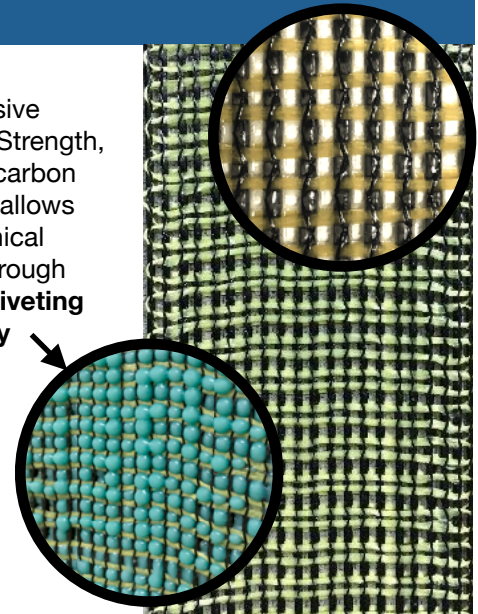
- Collision
- Corrosion
- Fire
- Age
- Overuse

Structural Benefits

- Strength increase
- Crack & moisture Control
- Seismic resistance
- Arrest structure movement
- Substrate stress reduction

Key Features:

- Non Corrosive
- Ultra High Strength, pre-cured carbon
- Open Grid allows for mechanical bonding through **adhesive riveting technology**



PRODUCT SPECIFICATIONS

Base Material Carbon Filament tows and Kevlar roving

Shelf Life Unlimited

Color Black (Carbon) / Yellow (Aramid)

Carbon Filament Tensile Strength, ksi (MPa) 800 (5,515)

Carbon Filament Tensile Modulus, ksi (MPa) 36,000 (248,000)

Area per tow, sq in (mm sq) 0.005 (3.23)

Area for 21 tows (4in strap) sq in (mm sq) 0.105 (67.74)

Thermal Resistance >300 °F (>150 °C)

Glass Transition Temperature >100 °C

Laminated CFRP System Mechanical Physical Properties

	Ultimate Tensile Strength ¹ f_{tu} Ksi (MPa)	Modulus of Elasticity ¹ E_f Ksi (GPa)	Ultimate Strain at Rupture ϵ^*_{fu} in/in (mm/mm)
Typical (mean) Values (μ)	342.4 (2361)	21,616 (149)	1.59%
Std. Dev (σ)	13.9 (96)	750 (5.2)	
min tested	325.7 (2246)	20,326 (140.1)	
ACI Design ($\mu-3\sigma$)	300.7 (2073)	19.334 (133.3)	

Laminate results at room temperature using SKRS Room 77°F curing epoxy resin

¹ASTM D3039 ²Thickness of cured laminate = 0.909 in (2.3mm)



Packaging. Standard packaging includes cardboard boxes. Labeled on box.

Preparation: Protect the work area from standing water and inclement weather. Surfaces may be damp. Surfaces must be clean and sound. Spalling or other damaged concrete must be removed to solid material. Paint, finishes and laitance must be removed. Grinding, chipping, scarifying, shot blasting, sand blasting, or water jet are all acceptable methods to prepare the substrate. For concrete and masonry applications, patch all uneven surfaces with Fortec #4550 LPL or #1276 Hi-Modulus Fiber Matrix epoxy resins. Broadcast silica sand on patches to avoid amine blush. Use oil-free compressed air to remove any dust debris immediately prior to application of epoxy resins. Keep Fortress Carbon-Kevlar Straps from contamination. Store in a clean and dry area away from direct sunlight. Keep in original packaging until installation and protect from physical damage. Remove dust, dirt, and any other foreign materials. Remove water, grease, wax, oil or any other liquids with an appropriate solvent.

Cutting. Fortress ReGrid Carbon-Kevlar Straps may be cut to a desired length with sharp snips or a sharp utility knife. Dull tools tend to fray the ends of the carbon tows and should be avoided.

Epoxy Resin. Fortress Xtreme, 4000 or 4070 epoxy resin is recommended for all applications for bonding Fortress ReGrid Carbon-Kevlar Straps.

Applications. For horizontal, vertical and overhead applications use the dry lay-up application method when installing Fortress ReGrid Carbon-Kevlar Straps.

Dry Lay-Up Application. Apply resin to the substrate at a uniform rate of approximately 20 ft²/gal (approx. 80 mils). Coverage yield will vary with substrate roughness. Remove the Clean Peel™ fabric from the Fortress ReGrid Carbon-Kevlar Strap. Using gloved hands and a plastic laminating trowel or roller, press the Fortress Carbon-Kevlar Strap into the resin. Continue to press on the strap to force resin to squeeze through the openings to remove voids for a proper bond. Add more resin if needed. Trowel resin evenly over the strap. Ensure resin penetrates the grid mesh and covers the strap completely. Position the plastic Mylar sheet over the Fortress Carbon-Kevlar Strap and trowel or roll the strap, forcing out all air voids until smooth. Again, ensure the resin covers the grid mesh completely. After cure, perform sounding to locate any voids. Inject epoxy resin as needed to fill all voids.

Qualifications. Except for standard Fortress installations by Fortress qualified installers, each structural and life safety application requires the design and certification of a licensed, professional engineer. See the Fortress Warranty for more details.

Cautions An externally applied CFRP system is a vapor barrier. Consult with a licensed, professional engineer to evaluate results of encapsulating porous substrates. Installation should be performed only by a Fortress trained and approved installer. Caution must be used when handling Fortress Carbon-Kevlar Straps. Gloves should be worn to protect against carbon dust skin irritation and exposed fiber ends. Use of an appropriate, properly fitted NIOSH approved respirator is recommended. As with any cutting and adhesive operation, proper eye protection should be used. Always follow OSHA and site safety requirements.

Keep Out Of Reach of Children - Keep Container Tightly Closed – Not For Internal Consumption – For Industrial Use Only

The information contained herein is included for illustrative purposes only and is, to the best of our knowledge, accurate and reliable. Fortress cannot however under any circumstances make any guarantee of results or assume any obligation or liability in connection with the use of this information. As Fortress has no control over the use to which others may put its product, the products are to be tested to determine if suitable for a specific application and to verify if our information is valid for a particular application. Responsibility remains with the specifier, contractor, installer, user, and owner for the design, application and proper installation of each product. Fortress reserves the right to change the properties of its products without notice. Prior to each use of any Fortress product, the user must always read, understand, and follow the warnings and instructions on the product's most current Technical Product Data Sheet, product label and Material Safety Data Sheet available at www.FortressStabilization.com.

LIMITED WARRANTY, DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY: Fortress Stabilization Systems. ("Seller") warrants its products to be free of defects in material and workmanship for a period of ONE (1) YEAR from the date of purchase. Under this Warranty and limitation of liability, Fortress will provide, at no charge, product and containers to replace any product. Fortress's obligation hereunder, is limited solely to such replacement and is subject to receipt by Fortress of a written notice of any alleged defects, promptly after discovery thereof, within the warranty period. Absence of such notice in writing during the warranty period constitutes a waiver of all claims with respect to such product. This Warranty excludes discoloration or change in visual appearance of the product due to the accumulation of or streaking of dirt or other airborne materials deposited on the surface from the atmosphere. Fortress does not warrant the color-fastness of any product unless specifically stated otherwise. Before application, the Buyer shall determine the suitability of the product for the intended use and Buyer assumes all risks and liabilities whatsoever in connection therewith. THIS WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IT IS UNDERSTOOD AND AGREED THAT BUYER'S SOLE REMEDY, AND THEREFORE SELLER'S LIABILITY, WHETHER IN CONTRACT, TORT, WARRANTY, IN NEGLIGENCE, OR OTHERWISE, SHALL BE LIMITED TO THE RETURN OF THE PURCHASE PRICE PAID BY PURCHASER OR REPLACEMENT OF ANY DEFECTIVE GOODS SOLD BY SELLER AND UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES. THE PRICE STATED FOR THE GOODS IS A CONSIDERATION IN LIMITING SELLER'S LIABILITY. The terms of this paragraph may not be orally modified. THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE FACE HEREOF.



(800) 207-6205 www.FortressStabilization.com 184 w. 64th St. Holland, MI 49423 USA