

## PRODUCT DESCRIPTION

CTech-LLC® Unidirectional Glass Wrap (UGW™) is a high strength glass fabric with fibers oriented in the 0° direction. GFRP is the abbreviation form of the phrase “glass fiber reinforced polymer”. Today GFRP systems are extensively being used for structural, industrial and research and development purposes due to their weight and durability. We can use glass fibers in different fields like strengthening and retrofitting of structures, sport equipment and automotive sectors, making sport car bodies and boats, bridge building and many other important fields.

Some of the benefits of using CTech-LLC® glass fiber polymers in strengthening and retrofitting of structures:

- As compared with other traditional materials glass fabrics are lighter in weight and stronger. They are also stiffer than steel.
- Using glass fibers in strengthening of structures is a very cost effective method.
- Glass fiber reinforced polymers are easy in installation.
- GFRP systems are corrosion resistant, so they can extend lifespan of different structures.
- Ctech-LLC® glass fabrics comply with different materials and standard adhesive resins.
- CTech-LLC® glass fibers are flexible enough so by using them you will be able to model them in different shapes.
- GFRP systems are excellent electrical and thermal insulation, so they can be used as a suitable material in electrical equipment.
- Glass fiber reinforced polymers are available in different types and we can use each type depends on our needs. For example, S-glass is used when tensile strength is important and E-glass is useful in Electrical application.
- CTech-LLC® glass fabrics comply with all latest standards.

Where can we use CTech-LLC® GFRP systems?

- Glass fiber reinforced polymers are powerful and cost-effective materials for strengthening and retrofitting of different types of structures.
- When there are some structural mistakes or we are going to change the use of a structure strengthening with GFRP fabrics are the most reliable method which can really help.
- Glass fibers are suitable materials for making sport equipment like sport car bodies and boats
- Today glass fibers are widely being used in automotive industry. We can make some of the components of cars by using these composites.
- Glass fabrics are excellent materials to be used in transport infrastructure like bus stops and run ways.

## APPEARANCE

Color: White

Material: Glass fiber fabric with a protective backing material.

Fiber Direction: Unidirectional

## STORAGE

Glass fibers should be stored at +10°C to +40°C and should not be exposed to direct sunlight. Keep the carbon fabrics in a dry place.

## DESIGN

CTech-LLC® system designing, should be based on provisions and relative building codes. All the calculations should be done by structural engineers according to the specific design criteria. Designing methods should be compatible with the latest version of relative building codes, standards and provisions.



## INSTALLATION

Installation of CTech-LLC® glass fabrics should be performed by licensed and specially trained groups of installers. The Installation must be compatible with existing relevant international codes.

## HOW TO USE

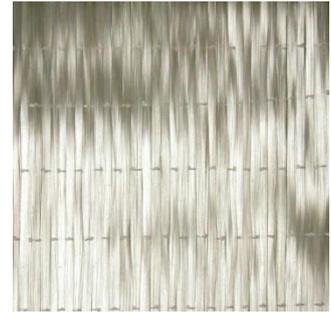
### PREPARATION OF SUBSTRATE

- Substrate preparation can highly effect on the quality of the performance of GFRP systems.
- All the surfaces must be cleaned from dirt, grime, dust, curing compounds, oils, grease, waxes and all the other contaminated materials which may cause voids behind the CTech-LLC® composites.
- Repair mortar must be used to repair all the eroded or damaged concrete surfaces.
- An industrial vacuum cleaner must be used to remove dust and dirt.
- All the surfaces need grinding, sandblasting, shot blasting, pressure wash or other common mechanical methods to reach an even concrete substrate.
- The sharp edges must be smooth and rounded to a minimum radius of 30 mm.
- Note that Concrete surfaces must be fully dried or cured so adhesive can properly dry.

Technical data	Unit	UGW™2.0h	UGW™4.h	UGW™6.0h	UGW™8.8h	UGW™12h
Elastic modulus*	GPa	70	70	70	70	70
Ultimate strength*	MPa	2200	2200	2200	2200	2200
Ultimate strain*	-	0.045	0.045	0.045	0.045	0.045
Thickness**	mm	0.08	0.16	0.24	0.35	0.48

\* In accordance with the standard ISO 10618

\*\* Based on total unidirectional fiber content



### MIXING

Epoxy compounds are usually supplied in two different containers. Before pouring the contents of component B into contents of component A, each part should be stirred separately to avoid deposit in container. Then part A and B should be mixed together depending on the required quantity. Process of mixing should take 3-5 minutes with a low speed mixer.

### TREATMENT

Glass fabrics can be cut with knives, commercial quality heavy-duty scissors, and rulers. These are proper tools for cutting glass fibers to obtain an ideal length and width. Any of the other cutting instruments can damage the fabrics.

### APPLICATION

The substrate must be clean and eroded or damaged concrete surfaces must be repaired by CTech-LLC® epoxy mortar. Cover the substrate with suitable form of ERS™ epoxy primer. Saturate the fabrics by a mechanical saturator. The saturator controls fiber-resin ratio in operation and converts glass fibers into pre-preg fabrics, so they can be used instantly on the surface of different elements.

Installation of all the layers of saturated fabrics must be done according to the design requirements. If required, additional fabrics can be used on top of previous layers. Using a roller can ensure all pockets are removed between fabric and substrate and there is a good bonding between them. This process should be performed by licensed and specially trained groups of installers.

### PROTECTIVE COATINGS

A protective coating must be applied on the surface of FRP system. The coating should be non-vapor-barrier and complies with the FRP system. Plaster final coating and paint final coating are two common methods which can be used to make barrier between damaging environment and structures. Painting should be done between 24 to 72 hours after final application of epoxy. The protective coating can protect surface against corrosion, decaying, cracking, chipping, fading and other typical problems which may happen for the structure.

### LIMITATIONS

Proper temperature for applying epoxies is between 4°C to 40°C. Increasing humidity rate causes reduction in strength of FRP systems.

### FIELD QUALITY CONTROL

Quantity of all the used materials for strengthening of different elements with FRP system, like glass fabrics and epoxies should be measured and noted every day.

### CAUTION!

All components of FRP system may cause skin irritation and sensitization. Use of chemical resistant gloves is recommended. Avoid breathing vapors and dust. Get medical attention if you are breathing with difficulty. Resins Products can cause strong eye irritation. Avoiding eye contact and Using safety goggles is necessary.

### SAFETY PRECAUTIONS

- Avoid eye contact.
- Do not allow resin contact with skin.
- Use safety gloves and glasses.
- Wear rubber boots and protective suits.
- Do not eat, drink or smoke when using the products.
- If any symptoms happened, go to open air and get medical attention.

### WARANTY

CTech-LLC® warrants its products to be free from manufacturing defects. Buyer determines suitability of product for use and assumes all risks. Buyer's sole remedy shall be limited to replacement of product. Any claim for breach of this warranty must be brought within one month of the date of purchase. CTech-LLC® shall not be liable for any consequential or special damages of any kind, resulting from any claim or breach of warranty, breach of contract, negligence or any legal theory. The Buyer, by accepting the products described herein, agrees to be responsible for thoroughly testing any application to determine its suitability before utilizing.