

# GRR™

Pre-manufactured Composite Glass Resin/Rods



Building  
&  
Transportation



Oil, Gas  
&  
Industrial



Offshore  
&  
Onshore



Water  
&  
Wastewater



## PRODUCT DESCRIPTION

CTech-LLC® Glass Composite Rod (GRR™) is a family of high strength, pre-manufactured composite glass/resin rods. GRR™ are used for internal reinforcement of concrete and as external reinforcement providing additional strength and stiffness to concrete, masonry, and wood structural elements. As a component of FibraOne™ FRP strengthening system, GRR™ rods are utilized for a technique known as “Near Surface Mounted” or NSM reinforcement.

## ADVANTAGES

- GRR™ rods can be effectively anchored into adjacent members.
- Non-corrosive.
- Light-weight.
- High-strength.
- Low impact on member appearance and aesthetically pleasing.
- Increasing in-plane or out-of-plane bending capacity of masonry wall.
- Effective topside reinforcing product for slabs and beams.

## TYPICAL USES

CTech-LLC® GRR™ is especially attractive for strengthening of surfaces that could be subject to abrasive or mechanical damage, such as parking decks, slabs and walkways. For masonry structures, the GRR™ rods can be installed in the existing joints, thus upgrading the capacity without negative aesthetic impact.

### TECHNICAL DATA

Fiber Type	Glass
Matrix Type	Vinylester or Polyester
Fiber Volume Fraction	70%
Tensile Strength	1300 MPa
Shear Strength	193 MPa
Pull-Out Strength	11.6 MPa
Modulus of Elasticity	40,800 MPa
Elongation at Break	1.6%

## DESIGN

Design calculations shall be made and sealed by a licensed, independent engineer knowledgeable with the design of FRP

strengthening systems.

## INSTALLATION PROCEDURE

### SURFACE PREPARATION

Integrity of the surface concrete should be checked prior to installing the GRR™ rod. Corrosion of internal steel reinforcement should be adequately addressed prior to installing the CTech-LLC® product. Make grooves onto the surface of the concrete element. Minimum groove width and depth is 1.5 times the rod diameter. Groove surfaces must be clean and sound. It must be dry and free of frost.

### CUTTING GRR™ COMPOSITE GLASS ROD

GRR™ Rod can be cut to appropriate length using a reciprocal saw with a fine tooth blade, grinder or wall chaser tool.

### APPLICATION

The CTech-LLC® GRR™ rods are bonded in the grooves, below the surface, using applicable adhesive resin and/or putty filler.

## STORAGE & SHELF LIFE

- Store out of direct sunlight in a dry place between 5°C – 35°C.
- Store rods in original packaging until ready to use. Keep dry and free from dust and oil.

## CAUTION

All components of FRP systems may cause skin irritation and sensitization. Use of chemical resistant gloves is

**PHYSICAL PROPERTIES**

	GRR™6	GRR™8	GRR™10	GRR™12	GRR™16	GRR™20	GRR™25	GRR™28	GRR™32
Rod Diameter	6 mm	8 mm	10 mm	12 mm	16 mm	20 mm	25 mm	28 mm	32 mm
Design Area	30 mm <sup>2</sup>	51 mm <sup>2</sup>	80 mm <sup>2</sup>	115 mm <sup>2</sup>	201 mm <sup>2</sup>	314 mm <sup>2</sup>	491 mm <sup>2</sup>	616 mm <sup>2</sup>	805 mm <sup>2</sup>

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.

**CTech-LLC<sup>®</sup>**

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**IMPORTANT NOTE:**

Before using any CTech-LLC<sup>®</sup> product, the user must review the most recent version of the product's technical data sheet, material safety data sheet and other applicable documents, available at [www.ctech-llc.com](http://www.ctech-llc.com).

**WARANTY:**

CTech-LLC<sup>®</sup> 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<sup>®</sup> 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.