



# CarboShield

## CarboShield Carbon Fiber Shells (CS-CFRP Shells)

### CarboShield Carbon Fiber Shells (CS-CFRP Shells)

#### DESCRIPTION

CarboShield carbon fiber shells (CS-CFRP Shells) is comprised of high-strength fiber reinforced polymer half cylinder shells bonded together with a specially formulated rubber toughened epoxy paste forming an annular space around the pile to be filled with high strength cementitious or epoxy grout (PolyGrout™). The CarboShield half shell jackets form the essence of CarboShield system. The half shells are manufactured using bidirectional fabric resulting in similar properties in both directions.

#### SUGGESTED USES

- CarboShield carbon fiber shells (CS-CFRP Shells) is designed to:
- Protect existing structure from further damage/corrosion,
  - Increase axial, flexural and shear capacity of structural members.
  - Enhance ductility of structural members.

#### PACKAGING

The half shells are manufactured in different shapes such as circle, square, rectangular and octagon, etc., in multiple sizes (Different lengths and diameters).

#### CS-CFRP SHELL PROPERTIES

Typical mechanical properties are given below:

Mechanical Properties in Longitudinal (0°, Direction) <sup>1</sup>	
Tensile Strength,psi	55,800
Tensile Modulus of Elasticity,ksi	3,830
Elongation at Break	1.1
Nominal laminate Thickness, inch	1/8

<sup>1</sup> Typical values and should not be construed as specifications.

Since the same amount of fibers are present in both orthogonal directions, the mechanical properties of the resulting composite are the same in both the zero and the 90 degree directions, as shown below

Mechanical Properties in Transverse (90°, Direction) <sup>2</sup>	
Tensile Strength,psi	55,800
Tensile Modulus of Elasticity,ksi	3,830
Elongation at Break	1.1
Nominal laminate Thickness, inch	1/8

<sup>2</sup> Typical values and should not be construed as specifications.

#### BONDING METHODS OF CS-CFRP SHELLS

Two options are provided for bonding the shells together: Option I, adhesively bonded; Option II, mechanically fastened. In Option I, the system is composed of two-layer composite jackets. The half shells are bonded together with seams staggered in both the hoop and longitudinal directions using high strength, toughened, structural epoxy adhesive. Typical thickness of each layer of shell is 1/8" and/or 1/4" depending on design load requirements. In Option II, the shells are spliced together using a backer plate and titanium self tapping screws. The annular space between the pile and the CarboShield shells shall be filled with cementitious or epoxy grout system.

The information contained herein is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on test and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. Always read, understand, and comply with hazard warnings described in the products' Material Safety Data Sheet(s) before use.