TECHNICAL DATA SHEET

C-GRID® 450

Carbon-Fiber Grid for Strengthening Timber Piles

Description

C-GRID® 450 is a high strength carbon-fiber/epoxy grid for structural repairs of timber piles. The C-GRID® 450 requires less grout fill leading to a much lighter structure when compared to typical steel reinforced repairs. The composition is carbon-fiber and epoxy resin. The C-GRID® 450 geometry is longitudinal and transverse spacing (2.36" x 2.36" / 60 mm x 60 mm).

Features

- Provides double the strength of the original timber pile
- Reduced weight when compared to steel reinforced repairs
- Non-corrosive (no steel to corrode)
- Lightweight and easy to install
- High tensile strength and modulus
- Requires much less grout when compared to steel reinforcement repair
- Requires only 1/4" (6.3 mm) grout cover
- Grid has excellent bond to grout
- Independently tested by Texas A&M University, Department of Civil Engineering, Structural and Materials Testing Laboratory

Installation

The C-GRID® 450 shall be unrolled and cut using tin snips or other suitable method. The cut width of C-GRID® 450 shall be determined by including enough material to be imbedded within the grout and a 6" (150 mm) overlap along vertical seam. The grid will require a minimum of ¼" (6.3 mm) grout cover. Locate the C-GRID® 450 between the elevations indicated in the specification and drawings. The C-GRID® 450 shall be wrapped around the timber pile with a minimum 6" (150 mm) overlap along the vertical seam. Use nylon zip ties, plastic clips or other plastic accessories to secure vertical seam and maintain the position of the grid during the pumping of grout. On long length repairs which require more than one panel of grid, the C-GRID® 450 shall be overlapped 6" (150 mm) above or below the first panel of grid. The fiberglass jacket shall be installed around the pile and C-GRID® 450.

Please refer to the SeaShield Series 400™ Engineering Specifications for complete installation guidelines.

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Notes

1. Centerline-to-centerline spacing between strands is nominal and based on the average number of strands per unit width. Actual spacing may vary by ± 0.10 inch (± 2.5 mm).

2. The longitudinal direction is in the direction of the roll and the transverse direction is across the width of the roll. For example, if a roll of C-GRID® 450 is 47.5" (1206 mm) wide the carbon strands in the transverse direction are 47.5" (1206 mm) in length. If a roll of C-GRID® 450 is 500 yards long, the longitudinal strands are 500 yards (457 m) in length.

3. Individual strand cross-sectional area is normalized to the cross-sectional area of the fibers in accordance with ACI 440.2R. The actual measured thickness and width are larger and shall not be used for design purposes.

4. Reported tensile strengths are typical or average properties based on testing. Tensile modulus values are based on properties reported by the carbon fiber supplier. C-GRID® 450 exhibits linear elastic behavior so failure strains are estimated using Hooke's Law.

5. C-GRID® 450, utilized by Denso, Inc. in the SeaShield Series 400 System, is protected under the following US and European Patents: 6,263.629; 5836,715; 6,123,879; 6,454.889; 6,632,309; 0861353; 1094171.

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Tech Data

Properties	Longitudinal	Transverse
Individual Strand Cross-Sectional Area	.00286 in.^{2} (1.85 mm^2)	.00286 in.^{2} (1.85 mm^2)
Average Number of Strands Per Unit Width	5.0 strands/ft (16.6 strands/m)	5.0 strands/ft (16.6 strands/m)
Area of Strands Per Unit Width	0.01454 in.^{2}/ft. (30.78 mm^2/m)	0.01454 in.^{2}/ft. (30.78 mm^2/m)
Strand Tensile Strength	1000 lbs (4.45 kN)	1000 lbs (4.45 kN)
Grid Tensile Strength Per Unit Width	45,080 lbs/ft (74.2 kN/m)	45,080 lbs/ft (74.2 kN/m)
Tensile Modulus of Elasticity	34,000 ksi (234,500 MPa)	34,000 ksi (234,500 MPa)
Elongation at Break	0.99%	0.94%

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