HYCHEM® INFRASTRUCTURE

PileMedic™ PLC100.60

Product Description

PileMedic™ PLC100.60 is a high-strength high-modulus Fiber Reinforced Polymer (FRP) laminate constructed with bidirectional carbon fabrics providing strength in both longitudinal and transverse directions. The laminate is wrapped around the column or pole and the overlapping portions are bonded together using QuakeBond™ 220UR (Universal Resin) or QuakeBond™ J201TC (Tack Coat) to create a strong shell around the existing structure.

PileMedic™ is unique in that it allows construction of a seamless structural shell around an existing column, utility pole or submerged pile. The annular space between PileMedic™ Jacket and the host pile can be filled with QuakeBond™ 320LV Low Viscosity epoxy resin or high-strength non-shrink grout.

Uses

- Repair of underwater piles
- Repair of bridge piers
- Repair and strengthening of corroded steel columns
- Repair and strengthening of timber utility poles and bridge piling
- Applicable to all materials: concrete, steel and timber

Advantages

- One flat sheet can be used to construct a shell of any size in the field, eliminating the expense and delays of special order jackets.
- The jacket provides significant lateral confining pressure (in the hoop direction) that increases the axial compressive capacity of the pile or column.
- Provides flexural (bending) enhancement.
- The seamless shell prevents migration of moisture and oxygen into the column, significantly reducing future rate of corrosion and deterioration.
- Annular space can be adjusted in the field to minimize the volume of grout or resin.
- Eliminates or reduces the need for costly divers in underwater pile repairs.
- Corrosion-resistant system can withstand various chemicals.
- Non-toxic, odorless resins are approved for potable water.
- Strength of the laminates can be verified prior to installation in the field (in contrast with wet layup FRP systems).
- A polyester scrim is provided on both faces, eliminating the possibility of galvanic corrosion when the laminate is installed in contact with steel columns.
- Laminates can be installed as single shells with overlapping joints along the column height or as a continuous spiral shell.
- The laminates are manufactured in our plant with the highest quality control.

HYCHEM®
Head Office: 1/30 Bluett drive
SMEATON GRANGE NSW 2567
PH: 1300 HYCHEM
WWW.HYCHEM.COM.AU

PileMedic™ PLC100.60

Fiber & Laminate Properties

		US UNITS	SI UNITS
Longitudinal (0°) Direction:			
Tensile Strength	(ASTM D3039)	101 ksi	698 MPa
Modulus of Elasticity	(ASTM D3039)	7,150 ksi	49,280 MPa
Ultimate Elongation	(ASTM D3039)	0.85%	0.85%
Transverse (90°) Direction:			
Tensile Strength	(ASTM D3039)	64.2 ksi	443 MPa
Modulus of Elasticity	(ASTM D3039)	2,940 ksi	20,260 MPa
Ultimate Elongation	(ASTM D3039)	1.42%	1.42%
Laminate Properties:			
Ply Thickness		0.026 in	0.66 mm
Barcol Hardness	(ASTM D2583)	45 min	45 min
Water Absorption	(ASTM D570)	0.7% max	0.7% max

Force Equivalency

A double layer of PileMedic™ PLC100.60 provides the following equivalent forces:
N12 (fy = 280 MPa) stirrups at 45 mm centres
N12 (fy = 280 MPa) bars placed vertically at 64 mm centres

Jacket Diameter mm[1]	Confining Pressure MPa[2]	Gain In Strength MPa[3]
305	6.0	24.1
610	3.0	12.1
915	2.0	8.0
1220	1.5	6.1
1525	1.2	4.8

(1) Cylindrical jackets constructed with two plies of PileMedic™ PLC100.60 laminate plus an 200 mm overlap beyond the starting point.
(2) Nominal confining pressure for a cylindrical jacket.
(3) Nominal increase in compressive strength of concrete column & grout due to confining pressure of jacket.

HYCHEM
Head Office: 1/30 Bluett drive
SMEATON GRANGE NSW 2567
PH: 1300 HYCHEM
WWW.HYCHEM.COM.AU

PileMedic™ PLC100.60

Application

1. Cut the required length of PileMedic™ considering the number of layers necessary and the overlap length beyond the starting point.
2. Wipe PileMedic™ with appropriate cleaner (e.g. acetone or MEK) using clean cloth.
3. Apply QuakeBond™ 220UR (Underwater Resin) or QuakeBond™ J201TC (Tack Coat) on the over-lapping regions of the laminate sheet.
4. Wrap the laminate around the pile or column to create a multi-layer jacket as required. Spacers may be used to control the size of the annular space between the host pile and the PileMedic™ jacket.
5. Use ratchet straps to temporarily hold the jacket in the desired size.
6. Seal the bottom of the annular space.
7. Before the epoxy cures, fill the annular space with non-shrink grout or resin; the hydrostatic pressure from the weight of the grout will press the PileMedic™ laminate plies against each other for improved bonding. For underwater applications, the grout or resin must be compatible for such applications.
8. For longer piles, repeat the above steps for additional 1.22m wide bands of jacket along the height of the pile; insert the lower portion of the new jacket a minimum of 1.22m inside the previously installed jacket.
9. Leave the installation undisturbed for 24 hours before removing the ratchet straps.
10. Apply appropriate coating on the exterior of the jacket.

Installation of PileMedic™ products must be performed only by specially- trained and approved contractors.

Laminates can be cut to appropriate length using commercial quality heavy duty shears. Care must be taken to support both sides of the laminate during cutting to avoid splintering. Since dull or worn cutting tools can damage, weaken or fray the fiber, their use should be avoided.

Packaging

Standard rolls are 1.27m x 76m. PileMedic™ laminates can be custom manufactured in widths up to 1.52m.

Shelf life and Storage

PileMedic™ laminates have unlimited shelf life when stored properly. Store in dry place at 0°-50° C.

Limitations

Design calculations must be made and certified by a licensed professional engineer.

Caution

PileMedic™ PLC100.60 laminates are non-reactive. They do not require a Material Safety Data Sheet (MSDS). However, caution must be used when handling since a fine carbon dust may be present on the surface. Gloves must therefore be worn to protect against skin irritation. Care must also be taken when cutting the laminates to protect against airborne carbon dust generated by the cutting procedure. Use of an appropriate, properly fitted NIOSH approved respirator is recommended.

First Aid

Appropriate Personal Protective Equipment (PPE) should be worn at all times when handling product. Consult SDS for more information.

HYCHEM
Head Office: 1/30 Bluett drive
SMEATON GRANGE NSW 2567
PH: 1300 HYCHEM
WWW.HYCHEM.COM.AU

PileMedic™ PLC100.60

Certificate of Compliance

Safety Data Sheet (SDS) will be supplied upon request and is included with each shipment.

Warranties and Disclaimers

Hychem warrants that this product shall conform to the technical specifications published in the product literature. The quality and fitness of the product is dependent upon the proper use and application of the product by the applicator. Hychem has no role in the application of the finished polymer other than to manufacture and supply its components. It is vital that the person applying this product understands the product and is fully trained and certified in the use of spray equipment and application of sol-gel materials. There are no warranties that extend beyond the description on the face of this instrument, except when provided in writing, directly by Hychem and executed under seal by a company officer.

Field Support

Field support where provided, does not constitute supervisory responsibility. Suggestions made by HYCHEM either verbally or in writing may be followed, modified or rejected by the owner, engineer or contractor since they and not HYCHEM are responsible for carrying out procedures appropriate to a specific application.

Customer Responsibility

The technical information and application advice given in this publication is based on the best information available at the time of print.
As the information herein is of a general nature, no assumption can be made as to the product suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by Commonwealth or State Legislation. The owner, his representative or the contractor is responsible for checking the suitability of products for their intended use.

HYCHEM®
Head Office: 1/30 Bluett drive
SMEATON GRANGE NSW 2567
PH: 1300 HYCHEM
WWW.HYCHEM.COM.AU