



PileMedic, LLC  
2055 E. 17<sup>th</sup> Street  
Tucson, AZ 85719 U.S.A.  
Phone: (520) 791-7000  
Fax: (520) 791-0600  
www.PileMedic.com

**Product Data Sheet**  
**PileMedic™ PLC100.60**  
**For Structural Strengthening of Columns and Submerged Piles**

**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 (Underwater 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.

**USE.**

- Repair of underwater piles
- Repair of bridge piers
- Repair & strengthening of corroded steel columns
- Repair & strengthening of timber utility poles & 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.

**PACKAGING**

Standard rolls are 50 in. X 250 feet (1.27 m X 76 m). PileMedic™ laminates can be custom manufactured in widths up to 60 inches (1.52 m).

**SHELF LIFE**

PileMedic™ laminates have unlimited shelf life when stored properly.

**STORAGE CONDITIONS**

Store in dry place at 30°-120° F (0°-50° C).

**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 overlapping 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 4-ft wide bands of jacket along the height of the pile; insert the lower portion of the new jacket a minimum of 4 inches 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.

**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.

**FORCE EQUIVALENCY**

A double layer of PileMedic™ PLC100.60 provides the following equivalent forces:

No. 4 Gr. 40 stirrup placed at 1.75 inches on center

No. 4 Gr. 40 bars placed vertically at 2.5 inches on center

<b>PILEMEDIC™ PLC100.60 PROPERTIES</b>			
		US Units	SI Units
<b>Longitudinal (0°) Direction:</b>			
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 %
<b>Transverse (90°) Direction:</b>			
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%
<b>Laminate Properties:</b>			
Ply Thickness		0.026 in.	0.66 mm
Barcol Hardness	(ASTM D 2583)	45 min	45 min
Water Absorption	(ASTM D 570)	0.7% max	0.7% max

<b>Jacket Diameter inches (mm)<sup>(1)</sup></b>	<b>Confining pressure psi (MPa)<sup>(2)</sup></b>	<b>Gain in strength psi (MPa)<sup>(3)</sup></b>
12	875 (6.0)	3500 (24.1)
24	440 (3.0)	1760 (12.1)
36	290 (2.0)	1160 (8.0)
48	220 (1.5)	880 (6.1)
60	175 (1.2)	700 (4.8)

- (1) Cylindrical jackets constructed with two plies of PileMedic™ PLC100.60 laminate plus an 8-inch (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.