

RENEWWRAP®

NSM Pre-Cured Carbon Fiber Bars



STRUCTURAL STRENGTHENING

High-Strength Near Surface Mount Carbon Fiber Bars

RenewWrap® pre-cured carbon fiber bars are designed to be used in near surface mounted (NSM) strengthening applications. RenewWrap CF bars are manufactured with a grit surface (bars) to promote adhesion with the bonding resin.

TYPICAL USES

RenewWrap CF NSM Bars may be used to strengthen or retrofit a wide range of concrete and masonry structures. They are most commonly used where traditional wet lay-up FRP systems are not suitable or where the FRP reinforcement requires additional protection from abrasion or vehicular traffic. NSM bars are used for strengthening existing structural members (concrete, wood, stone or masonry) in flexure and shear. Structures that are deficient due to either a structural flaw, deterioration or because of a change in use can often be brought to a useful capacity using NSM bars.

Typical applications include:

- Negative moment strengthening of slabs and bridge decks
- Reinforcement for cantilevered bridge decks for railing and traffic barrier upgrades
- Transverse reinforcement in double tee parking decks
- Reinforcing around slab openings
- Shear and flexural upgrades of walls
- Warehouse and industrial floor slabs
- Crack stitching

BENEFITS

- Lightweight and easy to handle
- Non-corrosive, may be placed close to concrete surface
- Use with RenewWrap™ NSM Gel or other approved resins
- Recessed reinforcement is protected from abrasion and traffic loadings
- Pre-stress Tendons in Corrosive Applications
- Precast Bridge Deck Panels
- Concrete Poles & Marine Pilings
- Stay-in-Place Formwork
- Un-bonded Post Tensioning
- Post Tensioning of Precast Members
- King Post Arrangement for Floor Slabs
- Replacement of Corroded Steel Tendons



MECHANICAL AND PHYSICAL PROPERTIES

Nominal Diameter	Nominal Area		f* fu - Guaranteed Tensile Strength		Ultimate Tensile Load		Ef - Tensile Modulus of Elasticity		Ultimate Strain		
	mm	in	mm ²	in ²	MPa	ksi	kN	kips	GPa	psi 10 ⁶	%
2	6	¼	31.67	0.049	2241	325	70.8	15.92	124	18	1.81%
3	10	⅜	71.26	0.110	2172	315	154.1	34.65	124	18	1.75%
4	13	½	126.7	0.196	2068	300	261.6	58.80	124	18	1.67%

PACKAGING

CF Bars are available in 20-ft lengths.

STORAGE AND SHELF LIFE

Store in a cool, dry place at 50-90 °F (10-32 °C) where bars cannot be damaged. No shelf life.



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RENEWWRAP®

NSM (Near Surface Mount) Gel



For Mounting NSM Pultruded CFRP Bars

RenewWrap® NSM Gel is a 2-part epoxy resin to be used with RenewWrap CF Bars in near surface mounted (NSM) applications.

TYPICAL USES

- Negative moment flexural strengthening of oneway slabs, beams and walls
- May also be used on bottom of structural members for positive moment flexural strengthening where RenewWrap fabrics are not specified
- Bonding RenewWrap CF Bars and Tapes into grooves cut into concrete for near surface mounted applications
- May be used for filling bug holes and other small voids

LIMITATIONS

- Do not thin with solvents
- Design calculations shall be made and sealed by a licensed, independent engineer knowledgeable with the design of FRP strengthening applications
- Pneumatic dispensing gun is recommended when using this product
- Installation shall follow the guidelines presented in the RenewWrap NSM Installation Guide

STORAGE AND SHELF LIFE

Store in a dry place at 40-90 °F (4-32 °C) out of direct sunlight. Material has a shelf life of 28 months when stored in unopened containers.

PACKAGING

- 53-oz. (1.6 L) dual cartridges
- 6 cartridges per case

YIELD

38 LF/cartridge kit (#3 bar)
22 LF/cartridge kit (#4 bar)

Notes:

- 1) Yield is based on ACI 440.2R minimum groove sizes as shown in Figure 1
- 2) Yield is based on round bars
- 3) Actual yield in field will depend on specified and as-cut groove dimensions

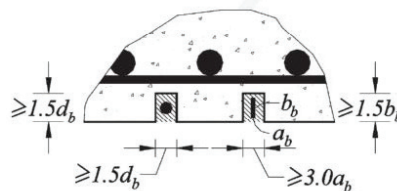


Figure 1 - ACI 440 Minimum Groove Dimensions (Ref: Figure 14.3a from ACI 440.2R-17)

BENEFITS

- Compatible with RenewWrap CF Bars
- Moisture insensitive before, during and after cure
- Withstands freeze-thaw conditions
- Excellent adhesion to concrete, CF Bars
- Little to no odor
- Available in 53-oz. cartridges



CAUTION

Product safety data sheets (SDS) should be consulted during application of or when handling the product



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RENEWWRAP[®]

NSM (Near Surface Mount) Gel



STRUCTURAL STRENGTHENING

GENERAL INFORMATION

Color White (Part A- Resin) Black (Part B - Hardener) Gray (Mixed)

PHYSICAL PROPERTIES

PROPERTY

Mix Ratio	1:1		
Consistency (Viscosity)	Non-sag	ASTM C881	
Heat Deflection Temperature (7 days at 75°F)	132°F (55.6°C)	ASTM D648	
	40 °F (4 °C)	@ 75 °F (24 °C)	@ 110 °F (43 °C)
Pot Life ¹	13 minutes		
Working Time ¹	36 minutes	20 minutes	12 minutes
Cure Time ³	72 hours	24 hours	18 hours

Notes:

1. Pot life is measured as the workable and applicable time of 1.0 gallon (3.8 L) when mixed in at @ 75 °F (24 °C).
2. Working and cure times are approximate and may vary slightly based on substrate temperatures and the temperature product was conditioned at prior to application.
3. Full cure is based on time it takes for product to reach mechanical properties.

MECHANICAL PROPERTIES

PROPERTY	38°F (3°C)	50°F (10°C)	75°F (24°C)	
Compressive Yield Strength	10,860 psi (74.9 MPa)	10,490 psi (72.3 MPa)	11,410 psi (78.7 MPa)	ASTM D695
Compressive Modulus	209,000 psi (1,441 MPa)	211,000 psi (1,454 MPa)	244,000 psi (1,682 MPa)	ASTM D695
Bond Strength @ 2 days cure	2,850 psi (19.7 MPa)	3,300 psi (22.8 MPa)	3,580 psi (24.7 MPa)	ASTM C882
Bond Strength @ 14 days cure	2,790 psi (19.2 MPa)	4,090 psi (28.2 MPa)	3,940 psi (27.2 MPa)	ASTM C882
NSM Shear Bond Strength ¹	>1,000 psi (6.9 MPa)	See Note		

Notes:

1. Shear bond strength is measured using hinged beam testing of #3 and #4 RenewWrap CF bars and exceeds the recommended minimum bond strength required by ACI 440.2R-17 for NSM applications. Groove sizes in accordance with ACI 440.2R-17.

ENGINEERING SUPPORT

GeoTree Solutions provides no-cost, pre-bid, engineering support. Contact your sales representative for more information



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