

Hex-3R™ Composite Strengthening Systems

Hex-3R Wrap 107™

The Hex-3R Composite Strengthening Systems provide construction industry professionals with a viable alternative to traditional methods through the application of composite materials science. This carefully designed portfolio of high strength, high modulus, externally applied reinforcing elements represent a cost-effective and efficient alternative to strengthen or stiffen a structure without resorting to remove and replace methods or invasive internal rebuilding techniques.

Hex-3R Wrap 107 is a 27 oz/yd² E-glass unidirectional fabric. Material is field laminated using Hex-3R epoxy to form a glass fiber reinforced polymer used to strengthen structural elements.

Where to Use

- Loading increases
- Seismic strengthening
- Temporary strengthening
- Change in structural system
- Design or construction defects

Advantages

- Used for shear, confinement or flexural strengthening
- Flexible, can be wrapped around complex shapes
- Lightweight
- Non-corrosive
- Acid resistant
- Low aesthetic impact
- Economical
- This fabric is registered with ICBO and is pre-approved for use on specific Caltrans projects

Packaging

- Rolls: 50 in. x 150 linear feet

E-glass Fiber Properties

Tensile strength	330,000 psi
Tensile modulus	10.5 msi
Density	2.54 g/cc
Elongation	4.0 %

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Hex-3R Wrap 107™

Hex-3R Epoxy 300™ and Hex-3R Wrap 107 Laminate Properties

Properties after standard cure followed by standard post cure (70-75°F – 5 days, 48 hours at 140°F)

Property	Average Value ¹		Design Value ²		ASTM Test Method
	US Units	SI Units	US Units	SI Units	
	psi	MPa	psi	MPa	
Tensile Strength*	94,000	648	82,900	572	D3039
Tensile Modulus*	3,794,100	26,141	3,454,200	23,800	D3039
Tensile % Elongation *	2.57	2.57	2.21	2.21	D3039
140F - Tensile Strength	87,500	603	81,200	560	D3039
140F - Tensile Modulus	3,661,900	25,230	3,14,400	23,526	D3039
140F - % Elongation	2.55	2.55	2.37	2.37	D3039
Compressive Strength	83,000	572	66,200	457	D695
Compressive Modulus	4,281,400	29,499	2,696,200	18,576	D695
90 deg Tensile Strength	7,200	50	3,300	23	D3039
90 deg Tensile Modulus	1,245,000	8,578	843,600	5,812	D3039
90 deg %Tensile Elongation	1.20	1.20	1.02	1.02	D3039
Shear Strength+/-45 In Plane	6,500	45	6,200	42	D3518
Shear Modulus +/-45 In Plane	345,400	2,380	68,500	472	D3518
Ply Thickness (inches/mm)	0.04	1.016			

Hex-3R Epoxy 306XR™ and Hex-3R Wrap 107 Laminate Properties

Properties after standard cure followed by standard post cure (70-75°F – 5 days, 48 hours at 140°F)

Property	Average Value ¹		Design Value ²		ASTM Test Method
	US Units	SI Units	US Units	SI Units	
	Psi	MPa	psi	Mpa	
Tensile Strength*	87,600	604	74,700	514	D3039
Tensile Modulus*	3,706,900	25,541	3,361,900	23,164	D3039
Tensile % Elongation *	2.43	2.43	2.055	2.055	D3039
140F - Tensile Strength	72,700	501	64,300	443	D3039
140F - Tensile Modulus	3,327,700	22,928	3,037,900	20,932	D3039
140F - % Elongation	2.34	2.34	2.01	2.01	D3039
Compressive Strength	72,000	496	53,100	366	D695
Compressive Modulus	4,075,300	28,079	3,326,500	22,919	D695
90 deg Tensile Strength	6,800	47			D3039
90 deg Tensile Modulus	1,045,400	7,203	955,100	6,581	D3039
90 deg %Tensile Elongation	0.78	0.78	0.51	0.51	D3039
Shear Strength+/-45 In Plane	9,300	64	8,100	57	D3518
Shear Modulus +/-45 In Plane	334,400	2,304	307,700	2,120	D3518
Ply Thickness (inches/mm)	0.04	1.016			

* 24 sample coupons per test series; all other values based on 6 coupon test series

¹ Average value of test series – based on year 2000 testing program

² Average value minus 3 standard deviations calculated from the year 2000 testing program

