

Hex-3R Wrap 103™

The Hex-3R Composite Strengthening System is a carefully designed portfolio of high strength and modulus fabrics that are rugged, flexible and easy to field fit for efficient application. Hexcel Corporation's expertise in fabric architecture uses E-glass and carbon fibers to provide a range of durability, strength and modulus to meet engineering and aesthetic requirements.

Hex-3R Wrap 103™ is an 18 oz/yd² (600 gsm) carbon unidirectional fabric. Hex-3R Wrap 103™ is used where additional strength, modulus or environmental durability is required and is compatible with any of the Hex-3R™ 300 series epoxy resins. This fabric is ICBO registered.

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

Packaging

Rolls: 25 in. x 300 linear feet

Carbon Fiber Properties:

Number of Filaments	12,000
Tensile strength (psi)	560,000
Tensile modulus (msi)	33
Density (g/cc)	1.77
Elongation (%)	1.6

Hex-3R Composite Strengthening Systems

Hex-3R Wrap 103™

Hex-3R Epoxy 300™ and Hex-3R Wrap 103™ Laminate Properties

Properties after standard cure (70-75°F – 5 days and 48 hour postcure at 140° F)

Property	Average Value ¹		Design Value ²		ASTM Test
	US Units	SI Units	US Units	SI Units	Method
	psi	MPa	psi	MPa	
Tensile Strength*	123,200	849	94,400	651	D3039
Tensile Modulus*	10,239,800	70,552	9,050,000	62,355	D3039
Tensile % Elongation *	1.12	1.12	0.91	0.91	D3039
140F - Tensile Strength	123,000	847	90,600	625	D3039
140F - Tensile Modulus	10,136,900	69,843	8,666,300	59,711	D3039
140F - % Elongation	1.13	1.13	0.89	0.89	D3039
Compressive Strength	113,000	779	99,200	683	D695
Compressive Modulus	9,726,200	67,014	8,532,800	58,791	D695
90 deg Tensile Strength	350	24	3,275	12	D3039
90 deg Tensile Modulus	705,500	4,861	512,300	3,529	D3039
90 deg %Tensile Elongation	0.45	0.45	0.27	0.27	D3039
Shear Strength+/-45 In Plane	7,500	52	6,300	43	D3518
Shear Modulus +/-45 In Plane	362,500	2,498	340,000	2,342	D3518
Ply Thickness	0.04	1.016			

Hex-3R Epoxy 306XR™ and Hex-3R Wrap 103™ Laminate Properties

Properties after standard cure (70-75°F – 5 days and 48 hour postcure at 140° F)

Property	Average Value ¹		Design Value ²		ASTM Test
	US Units	SI Units	US Units	SI Units	Method
	psi	MPa	psi	MPa	
Tensile Strength*	116,200	801	87,400	602	D3039
Tensile Modulus*	9,754,500	67,209	7,754,400	53,427	D3039
Tensile % Elongation *	1.13	1.13	0.92	0.92	D3039
140F - Tensile Strength	117,700	811	95,200	657	D3039
140F - Tensile Modulus	10,107,600	69,641	9,163,500	63,137	D3039
140F - % Elongation	1.10	1.10	0.86	0.86	D3039
Compressive Strength	93,300	643	37,200	256	D695
Compressive Modulus	9,755,100	67,213	8,140,500	56,088	D695
90 deg Tensile Strength	4,100	28	2,900	21	D3039
90 deg Tensile Modulus	651,700	4,490	554,200	3,818	D3039
90 deg %Tensile Elongation	0.64	0.64	0.46	0.46	D3039
Shear Strength+/-45 In Plane	7,100	49	5,600	39	D3518
Shear Modulus +/-45 In Plane	344,300	2,372	317,600	2,189	D3518
Ply Thickness (inch/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

