

# LIGHT SHEET™

## SOLAR SUBSTRATES

### A FLEXIBLE PATH FORWARD

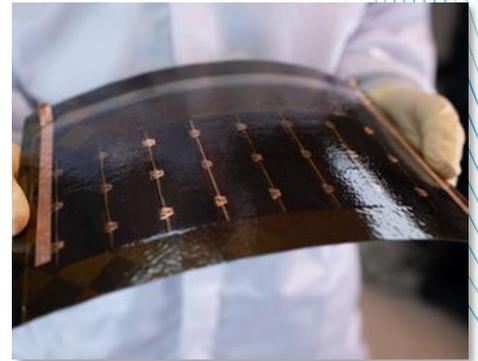
Light Sheet™ solar substrates are engineered structures, carbon with a novolac resin matrix, that combine strength with flexibility of thin ply layers of fabrics. Carbon Fiber volumes (Fv) up to 60% provide a high degree of carbon presence which produces the overall strength, structural integrity, and the overall flexibility of the structure.

### FEATURES

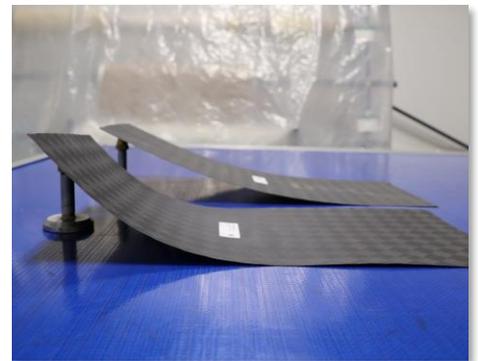
- **Strength and Stiffness:** Carbon fiber used in these structures provides high strength, greater than 400 Ksi in strength with low elongation, structural integrity, and still can be compacted into a small space. These structures maintain their shape and structural integrity, even when they are subjected to external loads and environment.
- **Adhesion and Saturation:** Fiber and matrix combination provides excellent adhesion to assure maximum performance yielding the highest composite properties as shown in Table below. These combinations may be tailored to provide a range of mechanical properties. Complete fiber and matrix wet out provides uniform and consistent load distribution over entire surface.

### BENEFITS

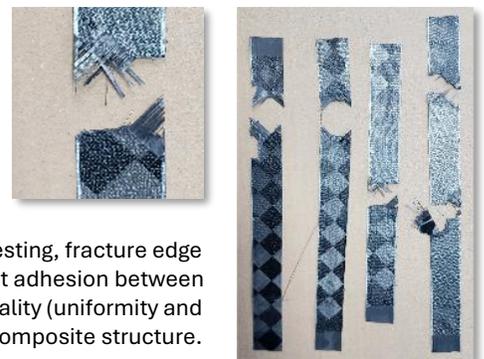
- This resin/matrix system combination allows the use of these structures in environments with temperature ranges less than -60°F and temperatures well above 300°F. This allows the for adaption and ability to use these structures in harsh environmental conditions.



Light Sheet™ solar substrate, cured in-situ with Kapton backing, populated with Solectial cells



Available in directionally stiff (back) or flexible (front) panels, with sizes up to 2'x4' available immediately. Larger 7'x18.5' panels are available upon request.



Test coupons used during ASTM testing, fracture edge surface shows excellent wet out adhesion between fiber and matrix, excellent quality (uniformity and consistency) of the composite structure.

### CONTACT US:

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THE WORLD'S FINEST COMPOSITES

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### RESULTS

Typical Properties							
Composite Properties using Unidirectional and PW +/-45 @ 81 gsm							
Tests	Orientation			Method	Results		
0° Tensile Strength	Unidirectional			ASTM D3039	415 Ksi		
0° Tensile Modulus	Unidirectional			ASTM D3039	38 Msi		
90° Tensile Strength	Unidirectional			ASTM D3039	15 Ksi		
90° Tensile Modulus	Unidirectional			ASTM D3039	8 Ksi		
+/-45° Tensile Strength	(2) plies @ 81 gsm and (1) ply 81 gsm Unidirectional			ASTM D3039	103 Ksi		
+/-45° Tensile Modulus	(2) plies @ 81 gsm and (1) ply 81 gsm Unidirectional			ASTM D3039	4 Msi		
0° Compression Strength	Unidirectional			ASTM D6641	18 Ksi		
0° Compression Modulus	Unidirectional			ASTM D6641	6 Ksi		
Interlaminar Shear	Unidirectional			ASTM D2344	16.5 Ksi		
Performance Based on Structure Mass							
Panel	Length (in)	Width (in)	Area (ft <sup>2</sup> )	Mass (g)	Mass (lbs)	g/ft <sup>2</sup>	lbs/ft <sup>2</sup>
#1, no Kapton	23.063	11.125	1.782	44.650	0.098	22.98	0.051
#2, with Kapton	23.750	11.688	1.928	47.480	0.105	28.64	0.063

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