

ULTRABLADE[®] X FABRIC SOLUTIONS FOR LIGHTER, LONGER, STRONGER BLADES

Ultrablade[®] X fabric solutions leverage Owens Corning's proprietary Hybrid Fabrics, that are specially designed to combine Glass and Carbon fabrics to provide unique advantages for superior performance. Ultrablade[®] X fabrics allow for a scalable fabric design that optimizes blade design at competitive costs.

- A unique combination of High Modulus Glass and Carbon Fibers leverage benefits of both materials and allows for use in standard Infusion processes.

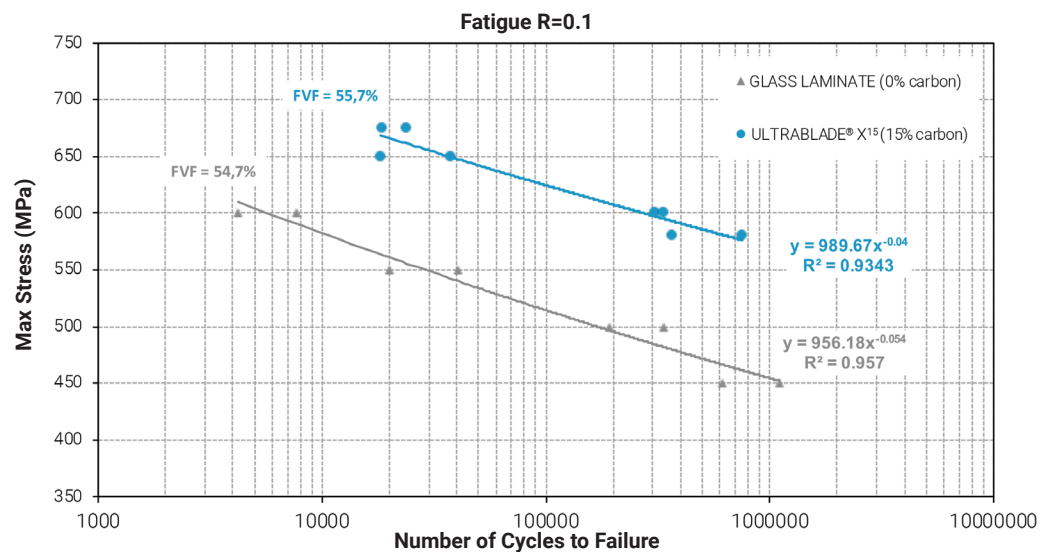
HYBRID CARBON AND GLASS FABRIC SOLUTION FOR WIND BLADE PRODUCTION

Product Benefits

- Higher stiffness
- Scalable performance
- Superior fatigue resistance
- Reduced cost over carbon materials
- Suitable for incumbent resin infusion process

Fatigue Resistance

Ultrablade[®] X fabrics offer premiere fatigue performance



Applications

Wind Blade Production

- Spar Caps
- Various Structural Unidirectional Applications



Packaging

(Standard Reference)

Information available upon request.

Mechanical Properties Comparison

	GLASS LAMINATE 0% CARBON	ULTRABLADE® X 15% CARBON	ULTRABLADE® X 25% CARBON
0° Tensile strength ¹ (MPa) (Standard deviation)	955 (27)	1105 (51.6)	1288 (60)
0° Tensile modulus ¹ (GPa) (Standard deviation)	46 (0.5)	63.1 (0.9)	71.5 (0.9)
0° Tensile Strain (%) (Standard deviation)	2.46 (0.1)	1.77 (0.03)	1.72 (0.04)
0° Compressive strength (MPa) (Standard deviation)	680 (55.5)	690 (31.2)	782.4 (38.2)
0° Compressive modulus (GPa) (Standard deviation)	46.4 (0.9)	60 (0.9)	67.8 (0.31)
0° Compressive Strain (%) (Standard deviation)	-	1.21 (0.06)	1.27 (0.07)

¹FVF=55%



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