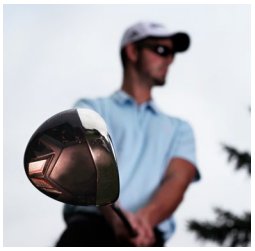
Quantum *Forged Preg*™ Composite Material

Thinner, with High Strength and Stiffness for the Most Demanding Applications

Typical Applications



Golf clubs and other sporting equipment

High-performance parts for automotive, aerospace and other industries

About the Technology

- Next-generation Quantum Engineered Structural Composites®
- Continuous carbon fiber-reinforced hybrid vinyl ester molding compound

Competitive Advantages

- Lightweight
- Exceptional strength and stiffness – higher than other composites
- Thinner than other composites, allowing molding in fabric form
- Enables a high-end look and feel

Grades/Properties

Property	*Forged Preg*™ 8575 Triaxial Carbon Fiber	*Forged Preg*™ 8585 Biaxial Carbon Fiber	*Forged Preg*™ 8595 Uni-directional Carbon Fiber
Tensile Modulus	4.8E+6 psi (33,090 MPa)	8.0E+6 psi (55,150 MPa)	14.0E+6 psi (99,300 MPa)
Tensile Stress (Break)	73,000 psi (503 MPa)	90,000 psi (620 MPa)	185,000 psi (1,276 MPa)
Flexural Modulus	4.8E+6 psi (33,090 MPa)	6.0E+6 psi (41,300 MPa)	13.5E+6 psi (93,100 MPa)
Flexural Stress (Break)	99,000 psi (682 MPa)	75,000 psi (517 MPa)	174,400 psi (1,202 MPa)
Glass Transition T_t, TanDelta	142 °C	142 °C	142 °C
Glass Transition T_g, Storage Modulus	118 °C	118 °C	118 °C
Density	1.48 g/cm^3	1.50 g/cm^3	1.48 g/cm^3
Shrinkage	<0.000 in/in	<0.000 in/in	<0.000 in/in

Competitive Materials

- Can be used in place of chopped fiber systems, to enable thinner parts with less complex shapes
- Compatible with chopped fiber systems for co-molding, compression molding and fast cure times

Supporting Your Development Needs

Quantum *Forged Preg*™ was created in collaboration with the world's largest maker of premium, high-performance golf clubs and an A. Schulman fiber supplier. We have the knowledge and capabilities to fully support your development needs, from concept development through testing and validation.

Learn more about Engineered Composites materials and services available from A. Schulman at www.aschulman.com.