

TECHNICAL DATA SHEET

HTC™ 9593

Engineered Structural Composite® (ESC®) Molding Compound

HTC™ 9593 is a chopped carbon fiber reinforced ESC® molding compound. It is easily moldable and provides parts that are high strength, fatigue resistant, with high heat resistance and a low density. The carbon fiber is standard modulus PAN based 3K tow.

TYPICAL PROPERTIES | UNCURED

Form and Color Rolled Sheet, Natural Fiber Length Nominal 1.0-inch
Carbon Fiber Content Nominal-53% w/w Shelf Life: @ 10° F or below 6 months
Resin Content Nominal-47% w/w

TYPICAL PROPERTIES | CURED | “Net Shape” Specimen

Test	Procedure	Value
Specific Gravity, g/cc	ASTM D-792	1.55
Molding Shrinkage, inch/inch (mm/mm)	ASTM D-955	<0.002 (<0.002)
Flexural Strength, psi (MPa) ¹	ASTM D-790	75,000 (571)
Flexural Modulus, psi (GPa) ¹	ASTM D-790	7.0 x10 ⁶ (48.3)
Tensile Strength, psi (MPa) ¹	ASTM D-638	26,000 (179)
Tensile Modulus, psi (GPa) ¹	ASTM D-638	9.0 x10 ⁶ (621)
Izod Impact (notched) ft.lb./in. (J/M)	ASTM D-256	27 (1442)

¹ Tensile and Flexural Properties are determined using net shape molded specimens.

TYPICAL PROPERTIES | CURED | “Machined” Specimen

Test	Procedure	Value
Flexural Strength, psi (MPa) ²	ASTM D-790	53,500 (369)
Flexural Modulus, psi (GPa) ²	ASTM D-790	4.8 x10 ⁶ (33.0)
Tensile Strength, psi (MPa) ²	ASTM D-3039	21,700 (150)
Tensile Modulus, psi (GPa) ²	ASTM D-3039	5.4 x10 ⁶ (37.2)
Short Beam Shear, psi (MPa) ²	ASTM D-2344	3,900 (26.9)
Glass Transition Temp. °F (°C) TanDelta	ASTM D-7028	714 (379)

² Machined Properties are determined using specimen machined from molded 12"x12" panels with 80% mold coverage.

Note: The above cured properties are for both “Net Shape” and “Machined” specimens to respective test methods. Net shape specimens produce higher mechanical properties than machined specimens due to favorable fiber orientation in net shape molding. Established engineering practices use machined specimen data for structural analysis. Net shape specimen data represent best case, pristine properties.

– continued –

Data Sheet Continued

Technical Data Sheet HTC™ 9593

Molding Suggestions – HTC™ 9593 can be molded at temperatures in the range of 260-350° F, with 300° F suggested as a starting point. Cure times will be dependent on molding temperature and part thickness and will typically be 25+ minutes. Detailed molding suggestions are available on request. Cool molded parts at ambient temperature. A cooling fixture may be needed depending on part thickness and geometry.

Precautions – HTC™ 9593 contains carbon fibers and should be handled carefully in order to minimize skin contact. Molding areas should be well ventilated to minimize exposure to fumes. Presses must be provided with local exhaust to remove vapors from work areas. If adequate ventilation is not available, a respirator approved for removing organic vapor must be used. Care must be taken to prevent contact of carbon fibers with electrical equipment.

Typical Process Parameters

Suggested Equipment needed:

Circulating Air / Convection Oven

1. Pre-weigh desired amount of molding compound and cut charge pattern.
2. Pre-stage molding compound at 200° F \pm 5° F in an oven for 16 \pm 0.5-hours.
3. Place in mold at 260-325° F for 25 minute cure cycle depending on part thickness at 1000 PSI.
 - a. Thicker parts may take longer to cure.
4. Post cure at temperature up to 500° F \pm 20° F for a minimum of 4-hours, then allow to cool to room temperature.
5. For above data specimen were allowed to cool to room temperature out of mold then placed in oven and the temperature was ramped to 500° F. After two hours the samples were taken out of the oven and allowed to cool to room temperature.

The carrier film may tend to cling to the ESC®. It is easiest to remove after the charge has been pre-staged in the oven.

Typical Uncured and Cured Properties tested each lot of – HTC™ 9593:

- Fiber Content/Resin Content
- Specific Gravity
- Molding Shrinkage
- Mat Weight, (Areal Density)

Additional technical information and data on this material is available from Quantum Composites, Inc. Please contact us via phone, local representative, web site www.quantumcomposites.com or email info@quantumcomposites.com

NO WARRANTY – The above information is offered for your consideration, investigation, and verification. No warranty, expressed or implied, is given as to the materials described on this Technical Data Sheet. Quantum Composites, Inc. specifically disclaims any warranty of merchantability or fitness for any particular purpose. Final determination of the suitability of this material is the sole responsibility of the buyer. Contact our sales representative for assistance in developing procedures to fit individual requirements.

This ESC® product is generally intended to be compression molded in matched-metal die molds. Strength values may be affected by the molding process. **The values presented in this data sheet are typical values and are not to be interpreted as product specifications.**