

DuraForm[®] HST Composite

Selective Laser Sintering (SLS)

A fiber-reinforced material with an ideal mix of stiffness, strength and high temperature resistance.

General Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Specific Gravity (g/cm ³)	ASTM D792	1.20	1.20

Mechanical Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Tensile Strength Ultimate (MPa psi)	ASTM D 638	48-51	7050-7350
Tensile Modulus (MPa ksi)	ASTM D 638	5475-5725	795-831
Elongation at Break (%)	ASTM D 638	4.5	4.5
Flexural Strength, Ultimate (MPa psi)	ASTM D 790	83-89	12000-12900
Flexural Modulus (MPa ksi)	ASTM D 790	4400-4550	638-660
Hardness, Shore D	ASTM D2240	75	75
Impact Strength (J/m ft-lb/in) (notched Izod, 23°C)	ASTM D256	37.4	0.7
Impact Strength (J/m ft-lb/in) (unnotched Izod, 23°C)	ASTM D256	310	5.8
Gardner Impact (J ft-lb)	ASTM D5420	5	3.7

Data was generated by building parts using 100% virgin powder under typical default parameters. DuraForm HST Composite was processed on a Sinterstation[®] HiQ[™] + HS SLS System at 25 watts laser power, 10 m/sec [400 inches/sec] scan speed, and a powder layer thickness of 0.1 mm [0.004 inches].

Features

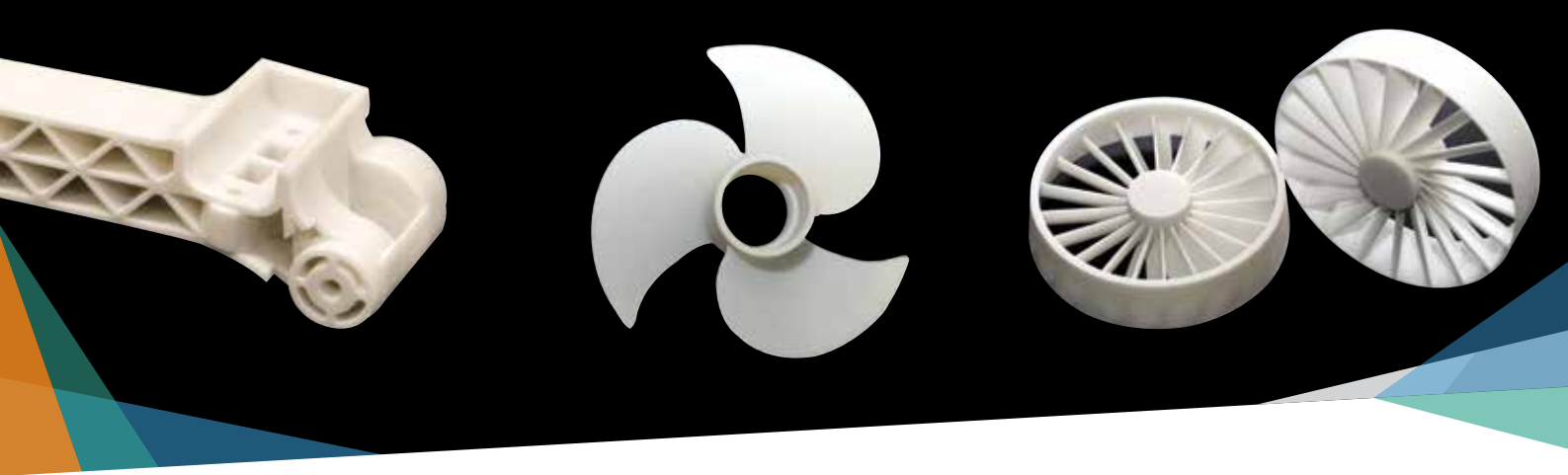
- High specific stiffness
- Elevated temperature resistance
- Anisotropic mechanical properties just like fiber-filled, injection molded materials
- Non-conductive and RF transparent
- Easy-to-finish surface

Benefits

- Functional prototypes can be tested in “real life” environments
- Complex end-use parts can be economically manufactured in low-to-medium volumes
- Excels in load-bearing applications at higher temperatures
- Attractive surface finish

Applications

- Functional prototypes and end-use parts that require high stiffness and/or elevated thermal resistance
- Typical Applications include:
 - UAV structural components
 - Housings and enclosures
 - Impellers
 - Connectors
 - Consumer sporting goods



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Thermal Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Heat Deflection Temperature	ASTM D 648 @ 0.45 MPa @ 1.82 MPa	184 °C 179 °C	363 °F 355 °F
Coefficient of Thermal Expansion ($\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ $\mu\text{m}/\text{in}\cdot^{\circ}\text{F}$)	ASTM E 831 0-50 °C 85-145 °C	138.3 267.2	76.8 148.4
Specific Heat Capacity ($\text{J}/\text{g}\cdot^{\circ}\text{C}$ $\text{BTU}/\text{lb}\cdot^{\circ}\text{F}$)	ASTM E1269	1.64	0.392
Thermal Conductivity ($\text{W}/\text{m}\cdot\text{K}$ $\text{BTU}\cdot\text{in}/\text{hr}\cdot\text{ft}^2\cdot^{\circ}\text{F}$)	ASTM E1225	1.503	0.359
Flammability	UL 94	HB	HB

Electrical Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Volume Resistivity (ohm-cm)	ASTM D257	6.7×10^{15}	6.7×10^{15}
Surface Resistivity (ohm)	ASTM D257	5.2×10^{15}	5.2×10^{15}
Dissipation Factor, 1 KHz	ASTM D150	0.028	0.028
Dielectric Constant, 1 KHz	ASTM D150	3.14	3.14
Dielectric Strength (kV/mm kV/in)	ASTM D149	18.5	470

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