

# DuraForm<sup>®</sup> 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 <sup>3</sup> )	ASTM D792	1.20	1.20

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<sup>®</sup> 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

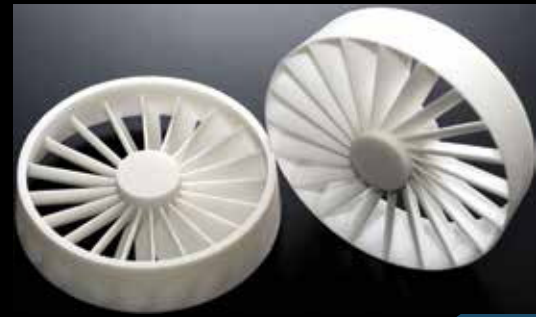
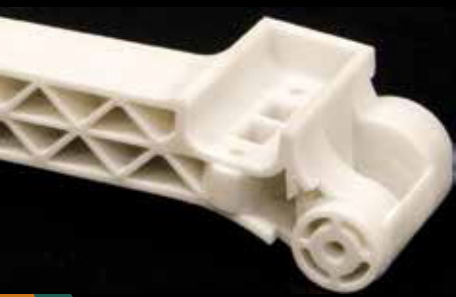
- High specific stiffness
- Elevated temperature resistance
- Anisotropic mechanical properties just like fiber-filled, injection molded materials
- Non-conductive and RF transparent
- Easy-to-finish surface

## 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	184 °C	363 °F
	@ 1.82 MPa	179 °C	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	138.3	76.8
	85-145 °C	267.2	148.4
Specific Heat Capacity (J/g $\cdot^{\circ}\text{C}$   BTU/lb $\cdot^{\circ}\text{F}$ )	ASTM E1269	1.64	0.392
Thermal Conductivity (W/m-K   BTU-in/hr-ft $^2\cdot^{\circ}\text{F}$ )	ASTM E1225	0.29	2.0
Flammability	UL 94	HB	HB

## Electrical Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Volume Resistivity (ohm-cm)	ASTM D257	6.7 X 10 <sup>15</sup>	6.7 X 10 <sup>15</sup>
Surface Resistivity (ohm)	ASTM D257	5.2 X 10 <sup>15</sup>	5.2 X 10 <sup>15</sup>
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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