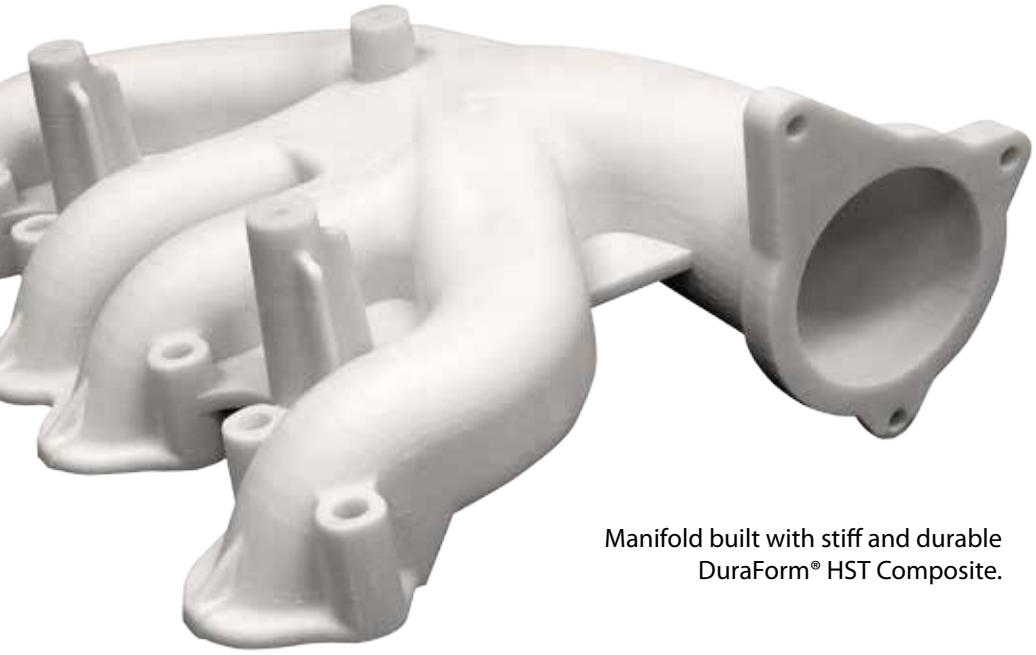
Quickparts®

MANUFACTURING*THE* FUTURE

DuraForm® HST Composite

DuraForm HST material is a fiber-filled nylon with anisotropic mechanical properties just like fiber-filled, injection molded materials. It is ideal for functional prototypes and end-use parts that require high stiffness and/or elevated thermal resistance.



Manifold built with stiff and durable DuraForm® HST Composite.

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

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

For more information visit
www.3dsystems.com/quickparts

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General Properties

Measurement	Condition	Metric	U.S.
Specific Gravity	ASTM D792	1.20 g/cm³	1.20 g/cm³

Mechanical Properties

Measurement	Condition	Metric		U.S.	
		X-direction	Z-direction	X-direction	Z-direction
Tensile Strength, Yield	ASTM D638	N/A*		N/A*	
Tensile Strength, Ultimate	ASTM D638	48-51 MPa	31-34 MPa	7050-7350 psi	4500-4900 psi
Tensile Modulus	ASTM D638	5475-5725 MPa	2900-3000 MPa	795-831 ksi	421-434 ksi
Elongation at Yield	ASTM D638	N/A		N/A	
Elongation at Break	ASTM D638	4.5 %	2.7 %	4.5 %	2.7 %
Flexural Strength, Yield	ASTM D790	N/A		N/A	
Flexural Strength, Ultimate	ASTM D790	83-89 MPa	64-68 MPa	12000-12900 psi	9275-9850 psi
Flexural Modulus	ASTM D790	4400-4550 MPa	2625-2825 MPa	638-660 ksi	381-410 ksi
Hardness, Shore D	ASTM D2240	75		75	
Impact Strength (notched Izod, 23 °C)	ASTM D256	37.4 J/m		0.7 ft-lb/in	
Impact Strength (unnotched Izod, 23 °C)	ASTM D256	310 J/m		5.8 ft-lb/in	
Gardner Impact	ASTM D5420	5 J		3.7 ft-lb	

Thermal Properties

Measurement	Condition	Metric		U.S.	
		X-direction	Z-direction	X-direction	Z-direction
Heat Deflection Temperature (HDT)	ASTM D648 @ 0.45 MPa @ 1.82 MPa	 184 °C 179 °C	 178.8 °C 135 °C	 363 °F 355 °F	 354 °F 276 °F
Coefficient of Thermal Expansion	ASTM E831 @ 0 - 50 °C @ 85 -145 °C	 138.3 µm/m-°C 267.2 µm/m-°C	 102.7 µm/m-°C 184.2 µm/m-°C	 76.8 µin/in-°F 148.4 µin/in-°F	 57 µin/in-°F 102.3 µin/in-°F
Specific Heat Capacity	ASTM E1269	1.503 J/g-°C		0.359 BTU/lb-°F	
Flammability (3 mm)	UL 94	HB		HB	

Electrical Properties

Measurement	Condition	Metric	U.S.
Volume Resistivity	ASTM D257	6.7 x 10^{15} ohm-cm	6.7 x 10^{15} ohm-cm
Surface Resistivity	ASTM D257	5.2 x 10^{15} ohm	5.2 x 10^{15} ohm
Dissipation Factor, 1 KHz	ASTM D150	0.028	0.028
Dielectric Constant, 1 KHz	ASTM D150	3.14	3.14
Dielectric Strength	ASTM D149	18.5 kV/mm	470 kV/in

* N/A = Not Applicable

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].

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