

DuraForm[®] HST Composite

A fiber-reinforced engineering plastic with excellent stiffness and high temperature resistance



General Properties

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

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 (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

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	363 °F
		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 85-145 °C	138.3	76.8
		267.2	148.4
Specific Heat Capacity	ASTM E1269	1.64 J/g·°C	0.392 BTU/lb·°F
Thermal Conductivity	ASTM E1225	1.503 W/m-K	0.359 BTU-in/hr-ft ² ·°F
Flammability	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

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RAPIDAPPLICATIONGROUP.COM

+1(833)-RAP-APP1
(+1-833-727-2771)

Location:

405 SOUTH 9TH ST.
BROKEN ARROW, OK. 74012 USA