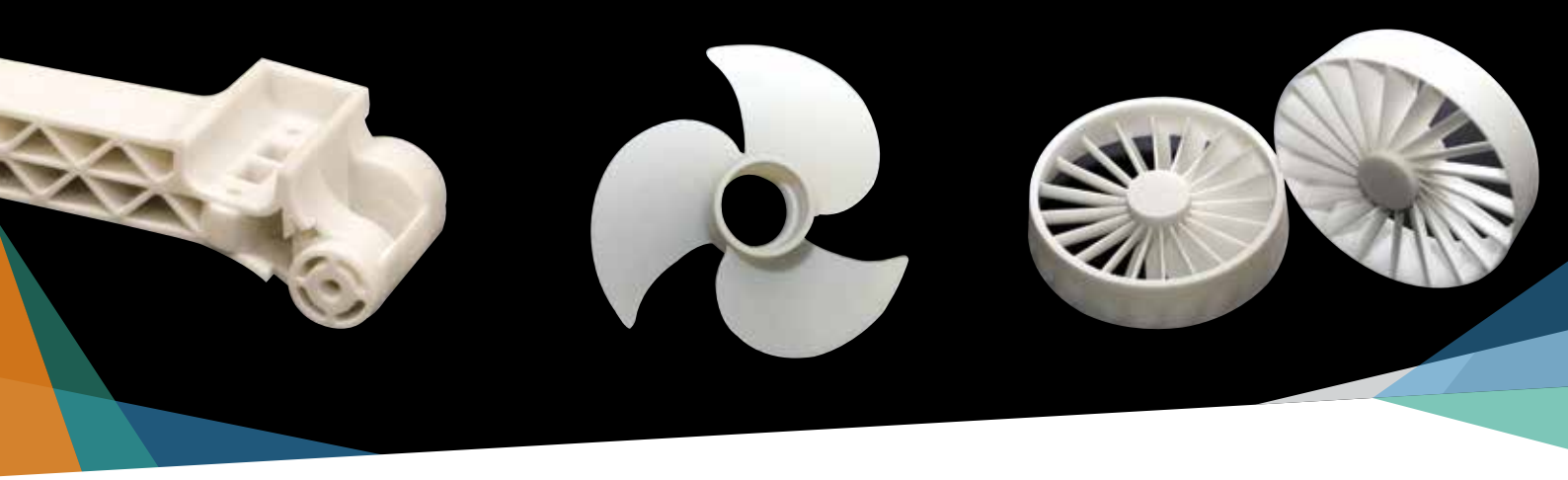


# DuraForm® HST Composite

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

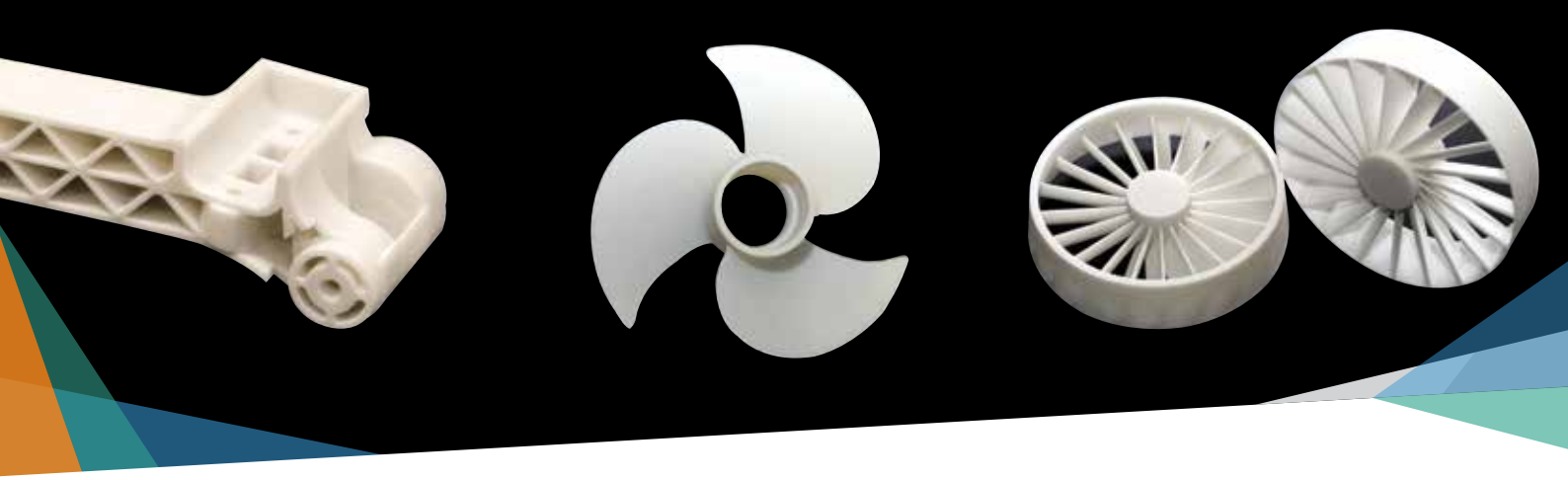
- High specific stiffness
- Elevated temperature resistance
- Anisotropic mechanical properties just like fiber-filled, injection molded materials
- Non-conductive and RF transparent
- Easy-to-finish surface

## 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



# DuraForm® HST Composite

Selective Laser Sintering (SLS)

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

## Thermal Properties

| MEASUREMENT | CONDITION | METRIC | U.S. |
|---|---|---|---|
| Heat Deflection Temperature | ASTM D 648<br>@ 0.45 MPa<br>@ 1.82 MPa | <br>184 °C<br>179 °C | <br>363 °F<br>355 °F |
| Coefficient of Thermal Expansion (µm/m-°C \| µm/in-°F) | ASTM E 831<br>0-50 °C<br>85-145 °C | <br>138.3<br>267.2 | <br>76.8<br>148.4 |
| Specific Heat Capacity (J/g-°C \| BTU/lb-°F) | ASTM E1269 | 1.64 | 0.392 |
| Thermal Conductivity (W/m-K \| BTU-in/hr-ft$^2$-°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 X $10^{15}$ | 6.7 X $10^{15}$ |
| Surface Resistivity (ohm) | ASTM D257 | 5.2 X $10^{15}$ | 5.2 X $10^{15}$ |
| 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 |

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].

3D SYSTEMS®

www.3dsystems.com



06-20