

# DuraForm® EX Plastic



BDSYSTEMS™



*DuraForm® EX Plastic is available in both Natural and Black colors.*

Manufacture tough, impact-resistant plastic prototypes or end-use parts requiring molded-part performance and capable of withstanding harsh environments.

## Applications

- Complex, thin-walled ductwork
  - Motorsports
  - Aerospace
  - Unmanned air vehicles (UAV's)
- Housings and enclosures
- Impellers
- Connectors
- Consumer sporting goods
- Vehicle dashboards and grilles
- Bumpers
- Snap-fit designs
- Living hinges

## Features

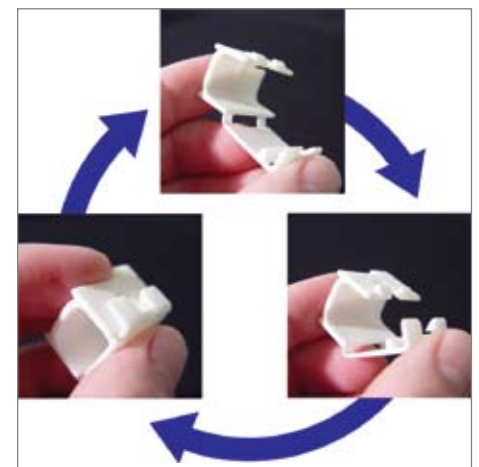
- Outstanding toughness
- Excellent impact resistance
- Repeatable mechanical properties
- Easy-to-process
- Consistent black or natural color

## Benefits

- Parts have the toughness of injection molded ABS and polypropylene
- Functional prototypes can be tested in "real life" environments
- Complex end-use parts can be economically manufactured in low and medium volumes
- No painting required for black parts
- Unique properties create new business opportunities for service bureaus



Outstanding toughness.



Tear-resistant living hinges survive hundreds of open-close cycles.

# DuraForm<sup>®</sup> EX Plastic

For use with all Sinterstation<sup>®</sup> Pro and Sinterstation<sup>®</sup> HiQ™ series SLS<sup>®</sup> Systems

## Minimum System Requirements

It is recommended that DuraForm<sup>®</sup> EX plastic be processed in a HiQ™-equipped system, which includes thermal controls. Software version 3.42 or higher (Sinterstation<sup>®</sup> HiQ™) or software version 3.545 or higher (Sinterstation<sup>®</sup> Pro) is required. SinterScan™ Software is highly recommended, and is required to maximize mechanical properties.



One-part black powder contributes to uniform black color.

### To order DuraForm<sup>®</sup> EX Natural plastic, please request part number:

Sinterstation <sup>®</sup> HiQ™ SLS <sup>®</sup> Systems	24129-902 (10 kg)
For Sinterstation <sup>®</sup> Pro SLS <sup>®</sup> Systems	24129-901 (100 kg IPC)

### To order DuraForm<sup>®</sup> EX Black plastic, please request part number:

For Sinterstation <sup>®</sup> HiQ™ SLS <sup>®</sup> Systems	24170-902 (10 kg)
For Sinterstation <sup>®</sup> Pro SLS <sup>®</sup> Systems	24170-901 (100 kg IPC)

## Technical Data

### General Properties

Measurement	Condition	Metric	U.S.
Specific Gravity	ASTM D792	1.01 g/cm <sup>3</sup>	1.01 g/cm <sup>3</sup>
Moisture Absorption - 24 hours	ASTM D570	0.48%	0.48%
Moisture Saturation	ASTM D570	1.15%	1.15%

### Mechanical Properties

Measurement	Condition	Metric	U.S.
Tensile Strength, Yield	ASTM D638	37 MPa	5366 psi
Tensile Strength, Ultimate	ASTM D638	48 MPa	6961 psi
Tensile Modulus	ASTM D638	1517 MPa	220 ksi
Elongation at Yield	ASTM D638	5%	5%
Elongation at Break	ASTM D638	47%	47%
Flexural Strength, Yield	ASTM D790	42 MPa	6091 psi
Flexural Strength, Ultimate	ASTM D790	46 MPa	6672 psi
Flexural Modulus	ASTM D790	1310 MPa	190 ksi
Hardness, Shore D	ASTM D2240	74	74
Hardness, Rockwell L	ASTM D785	69	69
Hardness, Rockwell M	ASTM D785	34	34
Impact Strength (notched Izod, 23°C)	ASTM D256	74 J/m	1.4 ft-lb/in
Impact Strength (unnotched Izod, 23°C)	ASTM D256	1486 J/m	27.8 ft-lb/in
Gardner Impact	ASTM D5420	11.8 J	8.7 ft-lb

### Thermal Properties

Measurement	Condition	Metric	U.S.
Heat Deflection Temperature (HDT)	ASTM D648 @ 0.45 MPa @ 1.82 MPa	188 °C 48 °C	370 °F 118 °F
Coefficient of Thermal Expansion	ASTM E831 @ 0 - 50 °C @ 85 - 145 °C	120 µm/m-°C 342 µm/m-°C	66.7 µin/in-°F 190 µin/in-°F
Specific Heat Capacity	ASTM E1269	1.75 J/g-°C	0.418 BTU/lb-°F
Thermal Conductivity	ASTM E1225	0.51 W/m-K	3.5 BTU-in/hr-ft <sup>2</sup> -°F
Flammability	UL 94	HB	HB

### Electrical Properties

Measurement	Condition	Metric	U.S.
Volume Resistivity	ASTM D257	1.3 X 10 <sup>13</sup> ohm-cm	1.3 X 10 <sup>13</sup> ohm-cm
Surface Resistivity	ASTM D257	4.9 X 10 <sup>12</sup> ohm	4.9 X 10 <sup>12</sup> ohm
Dissipation Factor, 1 KHz	ASTM D150	0.050	0.050
Dielectric Constant, 1 KHz	ASTM D150	4.5	4.5
Dielectric Strength	ASTM D149	18.5 kV/mm	470 kV/in

Data was generated by building parts under typical default parameters. DuraForm<sup>®</sup> EX Plastic was processed on a base-level HiQ™ SLS<sup>®</sup> System at 13 watts laser power, 5 m/sec [200 inches/sec] scan speed, and a powder layer thickness of 0.1 mm [0.004 inches].



3D Systems Corporation  
333 Three D Systems Circle  
Rock Hill, SC 29730 U.S.A.

Tel: +1 803.326.4080  
Toll-free: 800.889.2964  
Fax: +1 803.324.8810

moreinfo@3dsystems.com  
www.3dsystems.com  
NASDAQ: TDSC

Warranty/Disclaimer: The performance characteristics of these products may vary according to product application, operating conditions, material combined with, or with end use. 3D Systems makes no warranties of any type, express or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use.  
© 2008 by 3D Systems, Inc. All rights reserved. Specifications subject to change without notice. HiQ and SinterScan are trademarks, and the 3D logo, DuraForm, Sinterstation and SLS are registered trademarks of 3D Systems, Inc.