

# 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

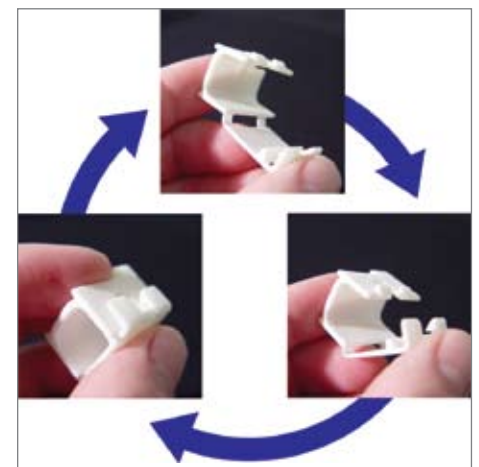
- Outstanding toughness
- Excellent impact resistance
- Repeatable mechanical properties
- Easy-to-process
- Consistent black or natural color

## 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<br>@ 0.45 MPa<br>@ 1.82 MPa     | 188 °C<br>48 °C            | 370 °F<br>118 °F                  |
| Coefficient of Thermal Expansion  | ASTM E831<br>@ 0 - 50 °C<br>@ 85 - 145 °C | 120 µm/m-°C<br>342 µm/m-°C | 66.7 µin/in-°F<br>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].



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