DuraForm® ProX® EX BLK

Strong, tough nylon 11 based plastic handles the rigors of repeated abuse for long-term use in harsh environments

### General Properties

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
<th>CONDITION</th>
<th>METRIC</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sintered Part Density @ 23 °C</td>
<td>ASTM D792</td>
<td>1.02 g/cc</td>
<td>0.037 lb/in³</td>
</tr>
<tr>
<td>Moisture Absorption @ 23 °C</td>
<td>ASTM D570</td>
<td>0.08 %</td>
<td>0.080 %</td>
</tr>
</tbody>
</table>

### Mechanical Properties

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
<th>CONDITION</th>
<th>METRIC</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength, Ultimate</td>
<td>ASTM D638</td>
<td>43</td>
<td>6210</td>
</tr>
<tr>
<td>(MPa</td>
<td>psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile Modulus (MPa</td>
<td>ksi)</td>
<td>ASTM D638</td>
<td>1570</td>
</tr>
<tr>
<td>Elastic Modulus at Break (%)</td>
<td>ASTM D638</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>at 5mm/min (%)</td>
<td></td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>at 50mm/min (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexural Strength, Ultimate</td>
<td>ASTM D790</td>
<td>51</td>
<td>7430</td>
</tr>
<tr>
<td>(MPa</td>
<td>psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexural Modulus (MPa</td>
<td>ksi)</td>
<td>ASTM D790</td>
<td>1360</td>
</tr>
<tr>
<td>Hardness, Shore D</td>
<td>ASTM D2240</td>
<td>76</td>
<td>76</td>
</tr>
<tr>
<td>Impact Strength (J/m</td>
<td>ft-lb/in) Notched Izod</td>
<td>ASTM D256</td>
<td>75</td>
</tr>
<tr>
<td>Unnotched Izod</td>
<td></td>
<td>3336</td>
<td>63</td>
</tr>
</tbody>
</table>

The parts used to generate the above data were generated by building parts using 80% virgin powder using default parameters on a ProX® SLS 500 printer.

### Features

- Outstanding durability for long-life
- Excellent impact resistance
- Fatigue resistant for applications like hinges requiring hundreds of open-close cycles
- Fuel and oil resistance make it perfect for automotive applications
- Uniform black coloring resists fading or staining
- Derived from sustainable non-petrochemical based plastics

### Benefits

- Complex end-use parts can be economically manufactured without the expense of tooling
- Parts have toughness required to replace injection molded ABS and polypropylene
- Functional parts can be tested in real life environments such as crash tests or other stress simulations
- No painting required for a deep black color that doesn’t fade or chip

### Applications

- Housing and enclosures
- Vehicle dashboards and grilles
- Automotive bumpers
- Snap-fits, living hinges and connector type parts
- Short production consumer goods/sporting equipment
- Complex designs, especially custom ductwork
- Exhaust and duct systems for aerospace and automotive uses
- Impellers
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Thermal Properties

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
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<th>METRIC</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Deflection Temperature @ 0.45 MPa</td>
<td>D648</td>
<td>193 °C</td>
<td>379 °F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>57 °C</td>
<td>134 °F</td>
</tr>
<tr>
<td>@ 1.82 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion (0-145 °C)</td>
<td>E831</td>
<td>168</td>
<td>94</td>
</tr>
<tr>
<td>(μm/m-°C</td>
<td>μin/in-°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Heat Capacity @ 23 °C</td>
<td>E1269</td>
<td>1.77</td>
<td>0.42</td>
</tr>
<tr>
<td>(J/g - °C</td>
<td>BTU/lb - °F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal Conductivity (W/m-K</td>
<td>in/hr-ft²-°F)</td>
<td>E1530</td>
<td>0.25</td>
</tr>
<tr>
<td>Flammability</td>
<td>UL 94</td>
<td>HB</td>
<td>HB</td>
</tr>
</tbody>
</table>

Electrical Properties

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
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<th>METRIC</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Resistivity (ohm - cm)</td>
<td>ASTM D257</td>
<td>1.09×10¹³</td>
<td>4.29×10¹⁶</td>
</tr>
<tr>
<td>Surface Resistivity (ohm)</td>
<td>ASTM D257</td>
<td>2.53×10¹²</td>
<td>2.53×10¹²</td>
</tr>
<tr>
<td>Dissipation Factor, 1 KHz</td>
<td>ASTM D150</td>
<td>0.051</td>
<td>0.051</td>
</tr>
<tr>
<td>Dielectric Constant, 1 KHz</td>
<td>ASTM D150</td>
<td>2.82</td>
<td>2.82</td>
</tr>
<tr>
<td>Dielectric Strength (kW/mm</td>
<td>kV/mil)</td>
<td>ASTM D149</td>
<td>17</td>
</tr>
</tbody>
</table>

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