

# DuraForm<sup>®</sup> PA Plastic

Durable polyamide (nylon) material for real-world physical testing and functional use.

## General Properties

| MEASUREMENT                    | CONDITION | METRIC                 | U.S.                   |
|--------------------------------|-----------|------------------------|------------------------|
| Specific Gravity               | ASTM D792 | 1.00 g/cm <sup>3</sup> | 1.00 g/cm <sup>3</sup> |
| Moisture Absorption - 24 hours | ASTM D570 | 0.07%                  | 0.07%                  |

## Mechanical Properties

| MEASUREMENT                            | CONDITION  | METRIC  | U.S.         |
|--|------------|---------|--------------|
| Tensile Strength Ultimate (MPa/PSI)    | ASTM D 638 | 43      | 6237         |
| Tensile Modulus (MPa/KSI)              | ASTM D 638 | 1586    | 230          |
| Elongation at Break (%)                | ASTM D 638 | 14      | 14           |
| Flexural Strength, Ultimate (MPa/PSI)  | ASTM D 790 | 48      | 6962         |
| Flexural Modulus (MPa/KSI)             | ASTM D 790 | 1387    | 201          |
| Hardness, Shore D                      | ASTM D2240 | 73      | 73           |
| Impact Strength (notched Izod, 23°C)   | ASTM D256  | 32 J/m  | 0.6 ft-lb/in |
| Impact Strength (unnotched Izod, 23°C) | ASTM D256  | 336 J/m | 6.3 ft-lb/in |
| Gardner Impact                         | ASTM D5420 | 2.7 J   | 2.0 ft-lb    |

Data was generated by building parts under typical default parameters. DuraForm<sup>®</sup> PA Plastic was processed on a base-level HiQ<sup>™</sup> SLS 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].

## Features

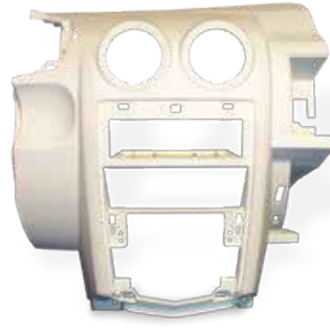
- Excellent surface resolution and feature detail
- Easy-to-process
- Compliant with USP Class-VI testing
- Compatible with autoclave sterilization
- Good chemical resistance and low moisture absorption

## Benefits

- Nicely balanced mechanical properties and processability
- Build prototypes that withstand functional testing
- Produce durable end-use parts without tooling
- Create accurate and repeatable parts as demanded by manufacturers
- Machinable and paintable for demonstration parts

## Applications

- Complex, thin-wall ductwork
- Functional prototypes that approach end-use performance properties
- Appropriate for low- to mid-volume rapid manufacturing
- Medical applications requiring USP Class-VI compliance, or biocompatibility
  - Motorsports
  - Aerospace
- Housing and enclosures
- Impellers and connectors
- Consumer sporting goods
- Vehicle dashboards and grilles
- Snap-fit designs
- Parts requiring machining or joining with adhesives



# DuraForm® PA Plastic

For use with all selective laser sintering (SLS) systems

## Thermal Properties

| MEASUREMENT  | CONDITION                              | METRIC          | U.S.                               |
|--|--|-----------------|------------------------------------|
| Heat Deflection Temperature  | ASTM D 648<br>@ 0.45 MPa<br>@ 1.82 MPa | 180 °C<br>95 °C | 356 °F<br>203 °F                   |
| Coefficient of Thermal Expansion<br>( $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ / $\mu\text{m}/\text{in}\cdot^{\circ}\text{F}$ ) | ASTM E 831<br>0-50 °C<br>85-145 °C     | 82.6<br>179.2   | 45.9<br>99.6                       |
| Specific Heat Capacity   | ASTM E1269                             | 1.64 J/g·°C     | 0.392 BTU/lb·°F                    |
| Thermal Conductivity   | ASTM E1225                             | 0.70 W/m-K      | 4.86 BTU-in/hr-ft <sup>2</sup> ·°F |
| Flammability   | UL 94                                  | HB              | HB                                 |

## Electrical Properties

| MEASUREMENT                | CONDITION | METRIC                      | U.S.                        |
|----------------------------|-----------|-----------------------------|-----------------------------|
| Volume Resistivity         | ASTM D257 | $5.9 \times 10^{13}$ ohm-cm | $5.9 \times 10^{13}$ ohm-cm |
| Surface Resistivity        | ASTM D257 | $7.0 \times 10^{12}$ ohm    | $7.0 \times 10^{12}$ ohm    |
| Dissipation Factor, 1 KHz  | ASTM D150 | 0.044                       | 0.044                       |
| Dielectric Constant, 1 KHz | ASTM D150 | 2.73                        | 2.73                        |
| Dielectric Strength        | ASTM D149 | 17.3 kV/mm                  | 439 kV/in                   |

Data was generated by building parts under typical default parameters. DuraForm® EX Plastic was processed on a base-level HiQ™ SLS 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].

# Quickparts

[www.Quickparts.com](http://www.Quickparts.com)

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