

# DuraForm® ProX® EX NAT

Strong, tough nylon 11 based plastic for production applications that handles the rigors of repeated cycling and use, even in harsh environments

## General Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Sintered Part Density @ 23 °C	ASTM D792	1.02 g/cc	28.23 lb/in <sup>3</sup>
Moisture Absorption @ 23 °C	ASTM D570	0.14 %	0.14 %

## Mechanical Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Tensile Strength, Ultimate (MPa   psi) XY orientation Z orientation	ASTM D638	51 (± 1) 40 (± 2)	7380 (± 120) 5801 (± 348)
Tensile Modulus (MPa   ksi) XY orientation Z orientation	ASTM D638	1590 (± 48) 1576 (± 57)	231 (± 7) 229 (± 8)
Elongation at Break (%) XY at 5mm/min XY at 50mm/min Z at 5mm/min (Recycled   100% virgin)	ASTM D638	61 (± 5) 64 (± 11) 9   24	61 (± 5) 64 (± 11) 9   24
Flexural Strength, Ultimate (MPa   psi)	ASTM D790	56 (± 2)	8150 (± 271)
Flexural Modulus (MPa   ksi)	ASTM D790	1436 (± 50)	208 (± 7)
Hardeness, Shore D	ASTM D2240	77	77
Impact Strength (J/m   ft-lb/in) Notched Izod Unnotched Izod	ASTM D256 ASTM D4812	91 (± 5) Did not break	1.7 (± 0) Did not break

## Features

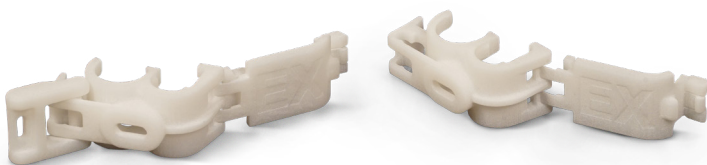
- Outstanding durability for long-life
- Excellent impact resistance
- Fatigue resistant for applications like hinges requiring hundreds of open-close cycles
- Fuel and oil resistance make it perfect for automotive applications
- Consistent natural white color
- Derived from sustainable non-petrochemical based sources

## Benefits

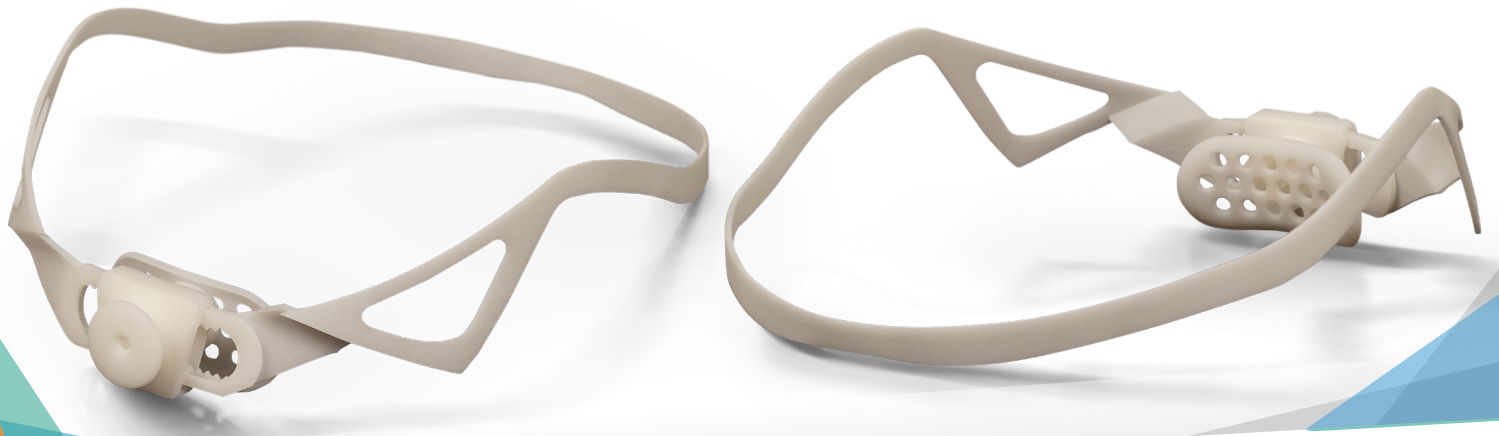
- Complex end-use parts can be economically manufactured without the expense of tooling
- Parts have toughness required to replace injection molded ABS and polypropylene
- Functional parts can be tested in real life environments such as crash tests or other stress simulations
- Especially reliable and accurate true-to-CAD parts production with the ProX SLS 6100
- Easy to use PA 11 material

## Applications

- Short run production of durable plastic parts  
- Consumer goods, electrical housings and enclosures, sporting equipment, etc.
- Vehicle instrument panels and components
- Snap-fits and living hinges
- Automotive bumpers and grille assemblies
- Exhaust and duct systems
- Impellers



Except as noted, the parts used to generate the above data were generated by building parts using 80% virgin powder using default parameters on a ProX® SLS 6100 printer.

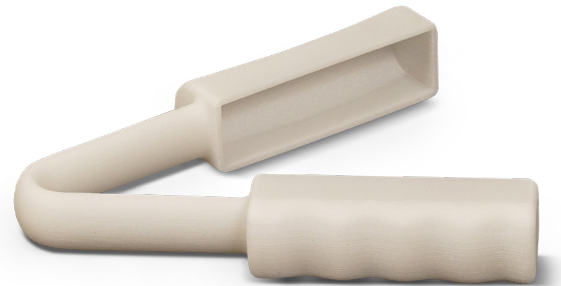


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## Thermal Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Heat Deflection Temperature @ 0.45 MPa @ 1.82 MPa	ASTM D648	192 °C (± 1) 56 °C (± 1)	377 °F (± 33) 132 °F (± 34)
Coefficient of Thermal Expansion (µm/m-°C   µin/in-°F) 0-50 °C 85-145 °C	ASTM E831	110 (± 4) 204 (± 9)	61 (± 2) 113 (± 5)
Specific Heat Capacity (J/g - °C   BTU/lb - °F) @ 23 °C @ 50 °C @ 100 °C @ 150 °C	ASTM E1269	1.60 1.77 2.65 3.03	0.38 0.42 0.63 0.72
Thermal Conductivity [K] (W/m-K   BTU-in/hr-ft <sup>2</sup> -°F)	ASTM E1530	0.26	1.80
Thermal Conductivity [K] (cm <sup>2</sup> -K/W   ft <sup>2</sup> -°F-hr/BTU)	ASTM E1530	119	0.07
Flammability	UL 94HB	Pass	Pass



## Electrical Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Volume Resistivity (ohm-cm   ohm-in)	ASTM D257	1.4 x 10 <sup>15</sup>	5.5 x 10 <sup>14</sup>
Surface Resistivity (ohm)	ASTM D257	1.9 x 10 <sup>13</sup>	1.9 x 10 <sup>13</sup>
Dissipation Factor, 1 KHz	ASTM D150	0.02	0.02
Dielectric Constant, 1 KHz	ASTM D150	3.42	3.42
Dielectric Strength (kV/cm   V/mil)	ASTM D149	160 (± 6)	406 (± 14)



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