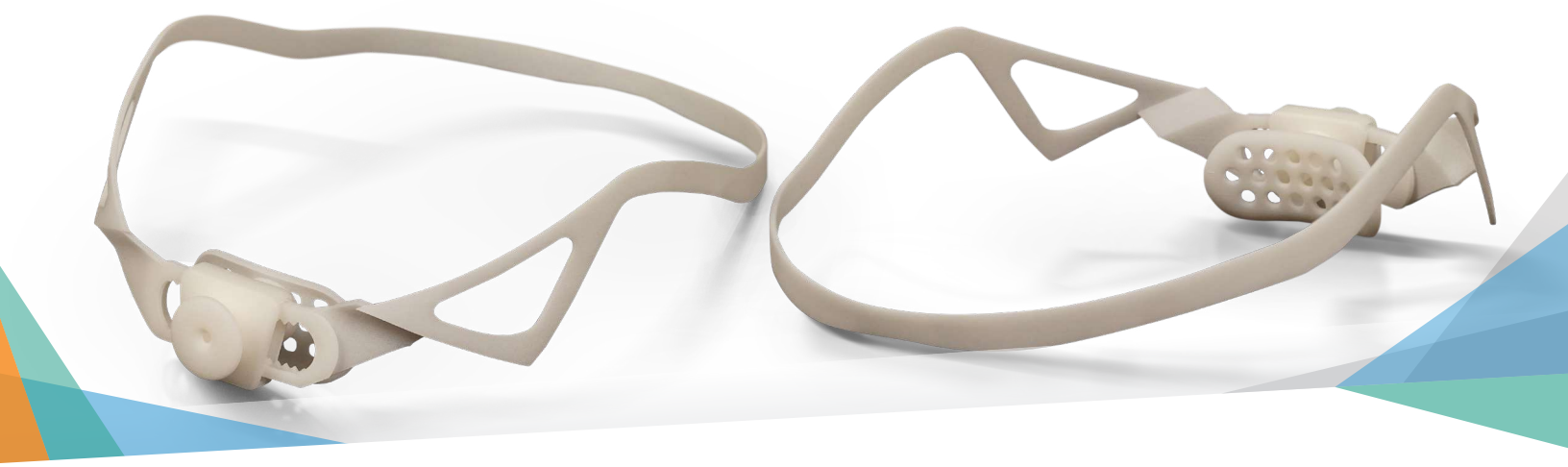


DuraForm® ProX® EX NAT

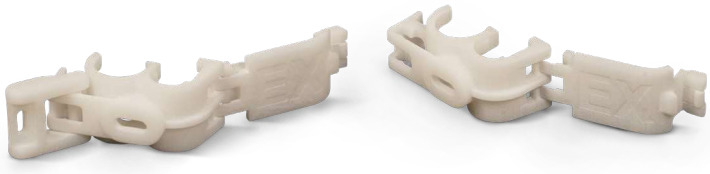
Strong, tough nylon 11 based plastic for production applications that handles the rigors of repeated cycling and use, even in harsh environments

General Properties

MEASUREMENT	CONDITION	METRIC	U.S.
Sintered Part Density @ 23 °C	ASTM D792	1.02 g/cc	28.23 lb/in^3
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



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.

Features

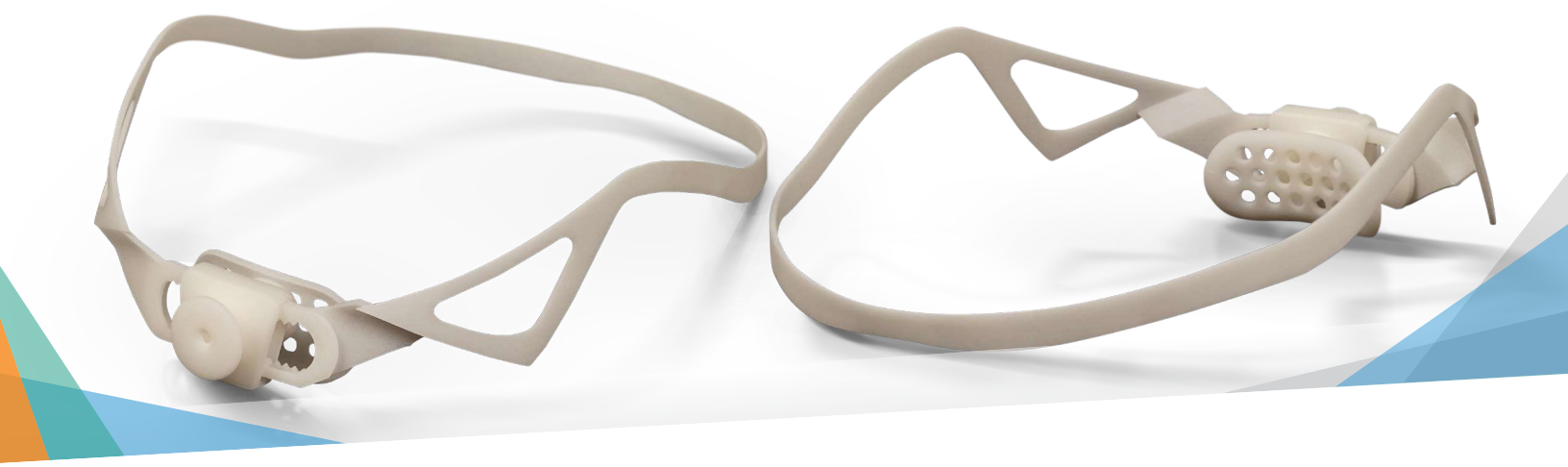
- Outstanding durability for long-life
- Excellent impact resistance
- Fatigue resistant for applications like hinges requiring hundreds of open-close cycles
- Fuel and oil resistance make it perfect for automotive applications
- Consistent natural white color
- Derived from sustainable non-petrochemical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

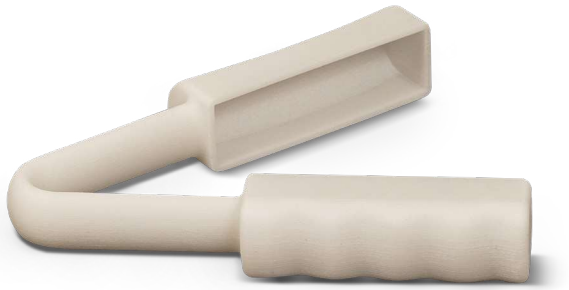


DuraForm® ProX® EX NAT

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

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-ft²- °F)	ASTM E1530	0.26	1.80
Thermal Conductivity [K] (cm²-K/W | ft²-°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	1.4×10^{15}	5.5×10^{14}
Surface Resistivity (ohm)	ASTM D257	1.9×10^{13}	1.9×10^{13}
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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