

Addigy® P3001

Powder Bed Fusion

Addigy® P3001 is a thermoplastic elastomer material for SLS 3D printing technology that combines a high energy return with easy processing.

The soft opaque elastomer meets the requirements of the European Toy Safety Directive 2009/48/EC.



Soft, rubber-like polymer materials are widely used in sports and lifestyle such as footwear, sports guards and protective gear. Additive manufacturing is a production technology well suited to the sports and lifestyle market as it allows for cost-efficient personalization and customization. Actual adoption, however, will require the availability of materials that combine the right property set with easy printing and a technology that can scale economically.

Typically, soft and elastomeric materials don't 3D print easily. With Addigy P3001 for SLS, our material scientists have managed to successfully combine both. At a Shore hardness of A88 and D35 with high elongation at break, the thermoplastic copolymer (TPC) exhibits a very high energy return of >70%.

Key Benefits

- Soft elastomer material
- Energy return level that is much higher than typical footwear materials
- Excellent elongation at break
- Easy processing without odors
- Soft touch and feel
- Certified ISO 10993-5 Cytotoxicity, ISO 10995-10 Irritation & Sensitization
- End-user benefits:
 - Better hygiene: parts can be dipped in boiling hot water to clean, without deformation
 - Easier communication on the field in team sports like hockey and rugby
 - 3D scanning rather than plaster bite, improving client comfort
 - Aesthetically pleasing parts
- Can be post-processed for smooth surfaces, including thin wall parts
- White opaque appearance

Ideal Applications

- Footwear
- Protective gear such as sports guards
- Consumer goods
- Components that need to comply with the Toy Safety Directive 2009/48/EC
- Parts requiring biocompatibility approval

Provisional Technical Data

PROPERTY	SPECIMEN	VALUE	UNIT	TEST METHOD
Appearance		Off-white		
Density		approx. 1080	kg/m ³	internal method
Bulk Density	powder	420–500	kg/m ³	ISO 60
Hausner Ratio	powder	1.25		ISO 787-11
Melting Point (10 °C/min)	powder	160	°C	ISO 11357-1/-3
Glass Transition Temperature (10 °C/min)	powder	-65	°C	ISO 11357-1/-2
Shore Hardness A	XY direction, flat	88		ISO 868
Shore Hardness B	Z direction, upright	87		ISO 868
Shore Hardness D	XY direction, flat	37		ISO 868

MECHANICAL PROPERTIES	VALUE	UNIT	TEST METHOD
Tensile Modulus XY	50	MPa	ISO 527-1/-2
Tensile Modulus Z	42	MPa	ISO 527-1/-2
Tensile Stress at break XY	10	MPa	ISO 527-1/-2
Tensile Stress at break Z	5.5	MPa	ISO 527-1/-2
Strain at Break XY	>250	%	ISO 527-1/-2
Strain at Break Z	50	%	ISO 527-1/-2

PROPERTY	VALUE	UNIT	TEST METHOD
Appearance	Off-white		
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Bulk Density	420–500	kg/m ³	ISO 60
Hausner Ratio	1.25		ISO 787-11
Melting Temperature (10 °C/min)	160	°C	ISO 11357-1/-3
Glass Transition Temperature (10 °C/min)	-65	°C	ISO 11357-1/-2
Shore Hardness A XY	88		ISO 868
Shore Hardness A Z	87		ISO 868
Shore Hardness D XY	37		ISO 868
Compression Set	24	%	ISO 815-1 (type B)
Rebound Resilience	76	%	ISO 4662

USA - Headquarters

7665 Commerce Way
Eden Prairie, MN 55344, USA
+1 952 937 3000

ISRAEL - Headquarters

1 Holtzman St., Science Park
PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000

stratasys.com

ISO 9001:2015 Certified

EMEA

Airport Boulevard B 120
77836 Rheinmünster, Germany
+49 7229 7772 0

ASIA PACIFIC

7th Floor, C-BONS International Center
108 Wai Yip Street Kwun Tong Kowloon
Hong Kong, China
+ 852 3944 8888



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www.stratasys.com/contact-us/locations

