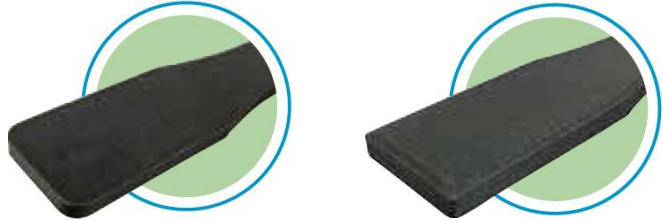


Essentium High Performance PLA

Description:

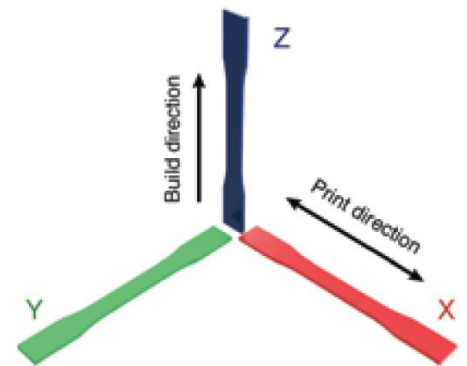
Essentium PLA has been specifically designed for use in additive manufacturing. Our PLA formulation has superior tensile strength, modulus and impact resistance in comparison to standard PLA. Furthermore, our PLA has a high heat deflection temperature stemming from its excellent heat-resistance and faster crystallization rates. This PLA prints with great detail at high speeds, provides less warping, and good bed adhesion. All of this means that you get the performance of an engineering grade material with the printability of standard PLA. We love printing with our PLA—we know you will too.



Metric	Method	Molded Properties	3D Printed Properties ¹		
			XY	YX	ZX
Tensile Strength, MPa	ASTM D638	66	61	51	43
Tensile Modulus, MPa	ASTM D638	3538	3387	3167	2824
Flexural Strength, MPa	ASTM D790	126	105	64	73
Flexural Modulus, MPa	ASTM D790	4357	3167	2307	2696
Nothched Izod Impact, J/m	ASTM D256	32	31	40	40

Metric	Method	Properties ²
Specific Gravity	ASTM D792	1.24
Melt Flow Rate ³ , g/10 min	ASTM D1238	7-9
Melting Point, °C	ASTM D3418	165-180
Glass Transition Temperature, °C	ASTM D3418	55-60
Heat Deflection Temperature, °C	ASTM D648	90

Recommended Print Settings:	
Extrusion Temperature, °C	190-240
Bed Temperature, °C	23-60
Enclosure Temperature, °C	Room Temperature
Print Speed, mm/s	30-70



Notes:

- (1) Print settings: nozzle temp: 235 °C, bed temp: 50 °C, infill: 100%, speed: 30mm/s, layer height: .3mm, extrusion multiplier: 1.0, nozzle diameter: 1.0mm
- (2) Values taken from pellet mfr. TDS
- (3) 210 °C, 2.16 kg

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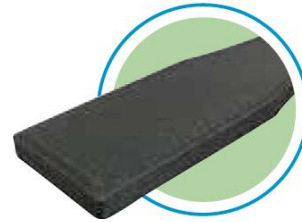
Technology protected by pending patents. ESS-04-V1

Essentium Materials, LLC
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 College Station, TX 77845
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 979.777.2354

Essentium High Performance PLA - Annealed

Description:

Essentium PLA has been specifically designed for use in additive manufacturing. Our PLA formulation has superior tensile strength, modulus and impact resistance in comparison to standard PLA. Furthermore, our PLA has a high heat deflection temperature stemming from its excellent heat-resistance and faster crystallization rates. This PLA prints with great detail at high speeds, provides less warping, and good bed adhesion. All of this means that you get the performance of an engineering grade material with the printability of standard PLA. We love printing with our PLA—we know you will too.



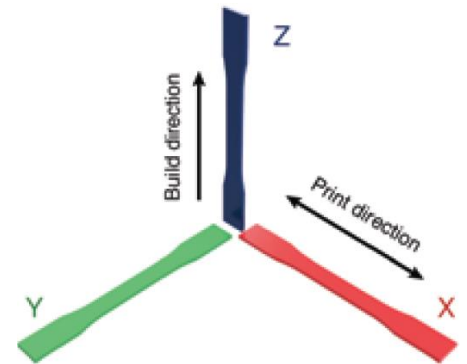
Metric	Method	3D Printed Properties ¹²		
		XY	YX	ZX
Tensile Strength, MPa	ASTM D638	64	55	43
Tensile Modulus, MPa	ASTM D638	3544	3229	3207
Flexural Strength, MPa	ASTM D790	107	92	72
Flexural Modulus, MPa	ASTM D790	3414	3266	2874
Nothched Izod Impact, J/m	ASTM D 256	82	89	60

Metric	Method	Properties ³
Specific Gravity	ASTM D792	1.24
Melt Flow Rate ⁴ , g/10 min	ASTM D1238	7-9
Melting Point, °C	ASTM D3418	165-180
Glass Transition Temperature, °C	ASTM D3418	55-60
Heat Deflection Temperature, °C	ASTM D648	90

Recommended Print Settings:	
Extrusion Temperature, °C	190-240
Bed Temperature, °C	23-60
Enclosure Temperature, °C	Room Temperature
Print Speed, mm/s	30-70

Notes:

- (1) Print settings: nozzle temp: 235 °C, bed temp: 50 °C, infill: 100%, speed: 30mm/s, layer height: .3mm, extrusion multiplier: 1.0, nozzle diameter: 1.0mm
- (2) Annealed at 110 °C for 20 min
- (3) Values taken from pellet mfr. TDS
- (4) 210 °C, 2.16 kg



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