

its full term is Poly-Lactic Acid and it is a thermoplastic polymer. Because it is derived from natural sources like corn and sometimes sugarcane, PLA is sometimes referred to a bioplastic. The majority of other thermoplastics are distilled from non-renewable resources like petroleum.

In addition, because it is a natural product, it is also long-term biodegradable. This means that when discarded into a composting system, PLA will naturally break down into its constituent parts typically within a few years.

Pros

Can be printed on a cold surface
more environmental-friendly
shinier and smoother appearance
More detail

Cons

Can deform because of heat
Less sturdy

Uses

Consumer products

1. Identification of the material

Trade name	tm filament PLA
Chemical name	Poly-Lactic Acid
Use	3D printing
Origin	tm filament Netherlands

2. Material properties

Melt temperature	145-160	°C	ASTM D3418
Glass transition temperature	55-60	°C	ASTM D3419
Heat distortion temperature HDTB (0,45 MPa)	56	°C	ISO 75
Vicat Softening Temperature	60	°C	ASTM D1525
Met Flow Rate (210 C/2.16 kg)	9,56	g	ASTM D1238
Density	1.24	g/cm ³	ASTM D790
Water absorption, 24 u	0.1	%	ASTM D570
Shrink rate	0.5 - 0.7	%	ASTM D955

3. Mechanical properties

Tensile Strength (break, 3.20 mm/50 mm/min)	52	MPa	ISO 527
Tensile Modulus (3.20 mm/1.0 mm/min)	1320	MPa	ISO 527
Tensile elongation, (break, 3.20 mm/50 mm/min)	5	%	ISO 527
Flexural Modulus (3.20 mm/15 mm/min)	3600	MPa	ISO 178
Flexural Strength (3.20 mm/15 mm/min)	108	MPa	ISO 178
Rockwell hardness (R-scale)	95		ASTM D785

4. Printer settings

Printer	Desktop FFF printer
Nozzle	0.4 mm A2 hardened
Layer height	0.2 mm
Infill	100% ±45
Extrusion Temperature	190 - 220 °C
Bed temperature	46 - 60 °C
Bed preparation	Kapton tape, Glass, 3D laque
Print speed	20-40 mm/sec
Requirements	Cooling fan

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