Technical data sheet PLA

Ultimaker

Chemical Name	Polylactic acid
Description	Ultimaker PLA filament provides a no-hassle 3D printing experience thanks to its reliability and good surface quality. Our PLA is made from organic and renewable sources. It's safe, easy to print with and it serves a wide range of applications for both novice and advanced users.
Key features	Good tensile strength and surface quality, easy to work with at high print speeds, user-friendly for both home and office environments, PLA allows the creation of high-resolution parts. There is a wide range of color options available.
Applications	Household tools, toys, educational projects, show objects, prototyping, architectural models, as well as lost casting methods to create metal parts.
Non suitable for	Food contact and in-vivo applications. Long term outdoor usage or applications where the printed part is exposed to temperatures higher than 50 ˚C.

Filament specifications	Value	Method
Diameter	2.85±0.10 mm	-
Max roundness deviation	0.10 mm	-
Net filament weight	750 g	-

Color information	Color	Color code
	PLA Green	RAL 6018
	PLA Black	RAL 9005
	PLA Silver Metallic	RAL 9006
	PLA White	RAL 9010
	PLA Transparent	n/a
	PLA Orange	RAL 2008
	PLA Blue	RAL 5002
	PLA Magenta	RAL 4010
	PLA Red	RAL 3020
	PLA Yellow	RAL 1003
	PLA Pearl White	RAL 1013

Mechanical properties (*)	Injection molding		3D printing	
	Typical value	**Test method**	**Typical value**	**Test method**
Tensile modulus	-	-	2346.5 MPa	ISO 527 (1 mm/min)
Tensile stress at yield	-	-	49.5 MPa	ISO 527 (50 mm/min)
Tensile stress at break	-	-	45.6 MPa	ISO 527 (50 mm/min)
Elongation at yield	-	-	3.3 %	ISO 527 (50 mm/min)
Elongation at break	-	-	5.2 %	ISO 527 (50 mm/min)
Flexural strength	-	-	103.0 MPa	ISO 178
Flexural modulus	-	-	3150.0 MPa	ISO 178
Izod impact strength, notched (at 23˚C)	-	-	5.1 kJ/m^2	ISO 180
Charpy impact strength (at 23˚C)	-	-	-	-
Hardness	-	-	-	-

Thermal properties	Typical value	Test method
Melt mass-flow rate (MFR)	6.09 g/10min	ISO 1133 (210 ˚C, 2.16 kg)
Heat deflection (HDT) at 0.455 MPa	-	-
Heat deflection (HDT) at 1.82 MPa	-	-
Glass transition	~60 ˚C	ISO 11357
Coefficient of thermal expansion (flow)	-	-
Coefficient of thermal expansion (xflow)	-	-
Melting temperature	145-160 ˚C	ISO 11357
Thermal shrinkage	-	-

Other properties	Typical value	Test method
Specific gravity	1.24	ASTM D1505
Flame classification	-	-

(*) See notes.

Notes

Properties reported here are average of a typical batch. The 3D printed test specimens were printed in the XY plane, using the normal quality profile in Cura 2.1, an UM2+, a 0.4mm nozzle, 90% infill, 210 ˚C nozzle temperature and 60 ˚C build plate temperature. The values are the average of 5 white and 5 black tensile bars. Ultimaker is constantly working on extending the TDS data.

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