Technical data sheet PLA

Ultimaker

Chemical composition	See PLA safety data sheet, section 3
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	350 g / 750 g	-
Filament length	~ 44 m / ~ 95 m	-

Color information

Color	**Color code**
PLA Green	RAL 6018
PLA Black	RAL 9005
PLA Silver Metallic	RAL 9006
PLA White	RAL 9010
PLA Transparant	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	-	-	2,346.5 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 MPa	ISO 178
Flexural modulus	-	-	3,150 MPa	ISO 178
Izod impact strength, notched (at 23 °C)	-	-	5.1 kJ/m^2	ISO 180
Charpy impact strength (at 23 °C)	-	-	-	
Hardness	-	-	83 (Shore D)	Durometer

Electrical properties*

	Typical value	**Test method**	**Typical value**	**Test method**
Dissipation factor (at 1 MHz)	-	-	0.008	ASTM D150-11
Dielectric constant (at 1 MHz)	-	-	2.70	ASTM D150-11

Thermal properties

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

*See notes

Other properties

	Value	Test method
Specific gravity	1.24	ASTM D1505
Flame classification	-	-

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 Ultimaker Cura 2.1, an Ultimaker 2+, a 0.4 mm nozzle, 90% infill, 210 °C nozzle temperature, and 60 °C. The values are the average of five white and five black specimens for the tensile, flexural, and impact tests. The Shore hardness D was measured in a 7-mm-thick square printed using the normal quality profile in Utlimaker Cura 2.5, an Ultimaker 3, a 0.4 mm print core, and 100% infill. The electrical properties were measured on a 54-mm-diameter disk with 3 mm thickness printed in the XY plane, using the fine quality profile (0.1 mm layer height) in Ultimaker Cura 3.2.1, an Ultimaker 3, a 0.4 mm print core, and 100% infill. Ultimaker is constantly working on extending the TDS data.

Disclaimer

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