



## Specification of Standard PLA

### ①Background

A degradable, environment-friendly, common-used material in the market, the most basic material in the 3D printing industrial.

### ②Main Ingredients

PLA, Toughener, Toner.

### ③Features

- Environmentally friendly, no odor, nontoxic.
- High intensity, bright and clear color.
- Low shrinking percentage and hardly curl.
- Suitable for 99% commonly used FDM 3D printers.

### ④Application and Target Audience

Any occasion without special requirements, 3D printing groups at all levels.

### ⑤PLA Filament Technical Specification

- Filament Diameter: 1.75mm
- Tolerance:  $\pm 0.03$ mm
- Printing Temperature: 190°C-220°C
- Heated Bed Temperature: 55-70°C
- Printing Speed: 30-100mm/s

### ⑥Relevant Parameters of Recommended Machine Types

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Type	Extruder / Heated Bed Type	Parameter
Creativity Ender 3	Bowden/Flexible Bed Sticker	Printing Temperature: 190-220°C Heated Bed Temperature: 55-65°C Printing Speed: 30-65mm/s Retracting Length: 2-4mm Retracting Speed: 60-100mm/s



Creality CR-10	Bowden/Glass Bed	Printing Temperature: 190-215°C Heated Bed Temperature: 65-70°C Printing Speed: 30-60mm/s Retracting Length: 2-5mm Retracting Speed: 80-110mm/s
Anycubic Mega-S	Bowden/ Microporous Coating Glass Bed	Printing Temperature; 190-220°C Heated Bed Temperature: 60-70°C Printing Speed: 30-80mm/s Retracting Length: 2-4mm Retracting Speed: 70-100mm/s
Prusa i3	Direct Drive Extruder/PEI Bed Sticker	Printing Temperature: 190-220°C Heated Bed Temperature: 55-70°C Printing Speed: 30-100mm/s Retracting Length: 0.8mm Retracting Speed: 30-40mm/s
Eryone Thinker S	Bowden/PEI Bed Sticker	Printing Temperature: 190-220°C Heated Bed Temperature: 55-70°C Printing Speed: 30-60mm/s Retracting Length: 4mm Retracting Speed: 90-110mm/s
Eryone Thinker SE	Bowden/Glass Bed	Printing Temperature: 200-220°C Heated Bed Temperature: 65-70°C Printing Speed: 30-70mm/s Retracting Length: 4mm Retracting Speed: 80-110mm/s
Eryone Thinker ER-20	Bowden/Silk-Screen Glass Bed	Printing Temperature: 190-220°C Heated Bed Temperature: 60-70°C Printing Speed: 30-100mm/s Retracting Length: 2-5mm Retracting Speed: 80-110mm/s

### ⑦ Basic Parameters

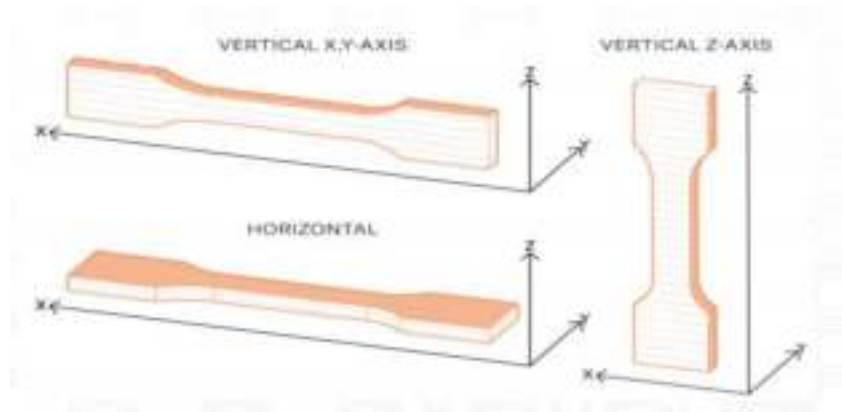
PLA Basic Parameter		
Physical Properties	Typical Value: Standard Value	Method: Standard
Peak Melt Temperature	167±5°C	ISO 11357
Glass Transition Temperature	55-60	ISO 11357
MFR [g/10min] (1)	7-15	ISO 1133



MVR [cm <sup>3</sup> /10 min] (1)	/	ISO 1133
Specific Gravity [g/cm <sup>3</sup> ]	1.24	ISO 1183
Moisture Absorption 24 h [%] (2)	/	/
Moisture Absorption 7 day [%] (2)	/	/
Moisture Absorption 4 weeks [%] (2)	/	/
Heat Deflection Temperature (0,45MPa)	55	ISO 75
Tensile Yield Strength Filament [MPa]	60	ISO 527-1
Explain		
(1) 2.16kg; 210°C		
(2) 28°C; humidity: 37%		

### Mechanical Strength of PLA Standard Printed Objects

Property / Print Direction	Horizontal	Vertical X, Y Axis	Vertical Z Axis	Method
Tensile Modules [GPa]	/	/	/	ISO 527-1
Tensile Yield Strength [MPa]	60	/	/	ISO 527-1
Elongation at Yield Point [%]	3	/	/	ISO 527-1
Impact Strength Charpy (2) [kJ/m <sup>2</sup> ]	24 (no notch)	/	/	ISO 179-1
1. Used Printer Type 2. Used Slice Software 3. Slice Parameter, Layer Height, Fill Ratio Printing Speed, Top Layer Number, Bottom Layer Number	1. Eryone Thinker SE/ER-20 2.Cura/Prusa Slicer 3.205°C, 0.2mm,100%,50mm/s, 5,5	/	/	
(2) Charpy unnotched, edgewise direction of flow according to ISO 179-1	/	/	/	Place it according to the left picture, use slice software and print it.



## FAQ

1.Q: Can PLA be used to print tableware?

A: Not recommended. Although PLA is degradable, food-grade raw material, the PLA with toner is non-food grade. If you really want to print a set of tableware, transparent PLA is suggested.

2.Q: Why my filament tangles? How can I solve it?

A: The tangle of filament isn't caused by the disordered or the imperfect winding. According to the production technology of filament, the filament winds back and forth (from left to right and then from right to left). Normally, there is no overline tangle. A common cause of tangle is that the filament end is not fixed to the holes of spool. Overline tangle or the changed winding direction make filament tangle. So customers need to fix the filament end to the proper holes of the spool.

3.Q: The nozzle is clogged by PLA, and how can I solve it?

A: Inconstant filament diameter, the lower nozzle temperature and frequent replacement with different kinds of filaments will lead to this problem. So, before you get started, clean the nozzle and turn up the temperature to a proper value.

4.Q: My prints have web-like strings (stringing) issues. How can I troubleshoot it?

A: Too high temperature makes the PLA filament melt and flow so fast. Please turn the temperature down to a proper value.

The retracting parameters are improper, so adjust the retracting length and speed.

5.Q: There are too much melted filament around the nozzle. What should I do?

A: This problem can be attributed to over-high temperature, low printing speed, and in the slice software, the nozzle diameter doesn't match with the extrusion output.

6.Q: The PLA filament was perfect when I opened the package. After several times of intermittent printing, my PLA filament snaps by accident during printing. Why?

A: Normally, the PLA filament in the printing process will not snap by themselves. However, after being affected by moisture, the degradable material PLA will be more brittle and easier to break, so you should pay attention to dampproof.

7.Q: The surface of my print isn't very smooth, and the extruded filament has inconstant diameters. Why?

A: The printing temperature is too high or too low. The temperature doesn't match well with the printing speed. You need to adjust the printing speed or temperature.

8.Q: Why my PLA-printed objects don't stick to the heated bed? How do I solve?

A: The distance between the nozzle and the bed is too far. Make sure your heated bed is leveled and it's clean. Then judge if the printing temperature and heated bed temperature are too low, and our customers should adjust them to correct ranges.