



Specification of TPU

①Background

In the actual market, customers need some filaments that have higher elasticity than PLA. TPU is a soft material and can be used for printing elastic objects.

②Main Ingredients

TPU, color additive.

③Features

- Flexible material with the same elasticity as rubber.
- The thinner and less filled the printed model is, the higher elasticity and softness it gets.
- Low viscosity, easy to cool.
- UV resistant.

④Application and Target Audience

Generally used for printing elastic products, suitable for all groups who want to print soft models.

⑤Technical Specification

- Filament Diameter: 1.75mm
- Tolerance: ± 0.05 mm
- Printing Temperature: 200°C-220°C
- Heated Bed Temperature: 0°C-60°C/ without heating
- Printing Speed: 15-40mm/s

⑥Shortcomings

- TPU is soft material, so the filament can't be rolled neatly.
- The material itself is soft and does not bear any force. It is recommended to use the direct drive extruder to get a good printing experience. The remote extruder can only print normally after modification.
- Bowden extruder is difficult to use and requires high level of users.



⑦ Relevant Parameters of Recommended Machine Types

Relevant Parameters of Recommended Machine Types		
Type	Extruder Type/Heated Bed Type	Parameter
Prusa i3	Direct Drive Extruder/PEI Bed Sticker	Printing Temperature: 200-210°C Heated Bed Temperature: 0-50°C/without heating Printing Speed: 15-30mm/s Retracting Length: 0.8mm Retracting Speed: 30-40mm/s

Basic Parameters

TPU Basic Parameter		
Physical Properties	Typical Value	Method
Specific Gravity [g/cm ³]	1.21	ISO 1183
Moisture Absorption 24 h [%] (2)	/	/
Moisture Absorption 7 day [%] (2)	/	/
Moisture Absorption 4 weeks [%] (2)	/	/
Heat Deflection Temperature (0,45MPa)	/	ISO 75
Tensile Yield Strength Filament [MPa]	40	ASTM D412
Shore Hardness	95A	
Explain		
(1) 2.16kg; 210°C		
(2) 28°C; humidity: 37%		



⑧FAQ

1.Q: Can I use TPU on Bowden Extruder printer?

A: Yes. The material itself is soft and does not bear any force. It is recommended to use the direct drive extruder to get a good printing experience. The remote extruder can only print normally after modification.

2.Q: Does the hot bed temperature need to be set?

A: No, you don't have to. You can print objects normally when the heated bed is at room temperature.

3.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.

4.Q: The nozzle is clogged by TPU, 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.

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

A: Too high temperature makes the TPU 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.

6.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.

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.