Flex TPU 64D Filament TDS

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1. Product Introduction

Key Features

- Shore 64D semi-rigid hardness for added structural stability
- High abrasion and wear resistance under repeated stress
- Excellent tensile strength and layer adhesion
- Smooth printing with reduced clogging and stringing
- ISO 10993-5/-10/-23 tested for biocompatibility support
- Compatible with Bambu Lab AMS Original Version only

Typical Applications

- Functional gears, rollers, and mechanical components
- Jigs, fixtures, and manufacturing aids
- Protective housings and semi-flexible enclosures
- Vibration dampening elements
- External wearables and flexible covers

2. Property Data

Mechanical Properties	Data	Method
Tensile Stress at Break (MPa)	39	ASTM D638
Young's Modulus (MPa)	392	ASTM D638
Elongation at Break(%)	395	ASTM D638
Toughness (N·m·m^-3)	120	ASTM D638
Tensile stress at 100%	25	ASTM D412
Tensile stress at 200%	30	ASTM D412
Tensile stress at 300%	36	ASTM D412

Other Properties	Data	Method

Vicat softening temperature (°C)	133	ISO 306
Shore Hardness (D)	64	ISO 7619
Melting Point (°C)	220	ASTM D3418
Biocompatibility	√	ISO 10993-5/-10/-23
Filament Density g/cm³	1.23	ISO 1183

3. Preparing for Printing

***Note*:**

TPU hygroscopicity instructions: TPU is highly hygroscopic, meaning it readily absorbs moisture from the air. Wet filament leads to poor print quality (stringing, bubbling, weak parts, clogging).

Long-term air exposure tips: Longer drying times may be needed if the filament has been exposed to humid air for extended periods.

Long-term printing tips: Consider using a drying print box during long prints.

Drying	Use a dedicated filament dryer or convection oven at 50-60°C for at least 4-6 hours
Drying Recommendation	Dry the filament thoroughly before every print, even if the spool is new
Storage	Store the filament in a sealed, airtight bag or container with desiccant packs (like silica gel) to minimize moisture absorption.

Nozzle	Standard brass or higher grade will work Size request: 0.4mm and above
AMS Compatibility	Compatible with Original Bambu Lab AMS. Not compatible with AMS 2. Not tested for AMS Lite yet.
Extruder	Direct drive provides the best results
Bowden setups	Compatible
Printer type	Enclosure not required

Build Plate Surfaces	PEI (smooth or textured) Glass with glue stick or Magigoo Specialized flexible filament build surfaces
Build Plate Clean	Isopropyl alcohol wipe
Tips for printing small items	Use a brim or raft if printing parts with small contact areas or sharp corners.

4. Printing with Fibreheart TPU 64D

Nozzle Temperature	240-270°C	Start in the middle (e.g., 255°C) and perform a temperature tower test for optimal layer adhesion and surface finish.
Bed Temperature	45°C	A heated bed is recommended for first layer adhesion.
Print Speed	30-80mm/s	Start conservatively (e.g., 30-40mm/s) and increase speed gradually while monitoring print quality.
First Layer	Start slower (e.g., 15-20mm/s) and slightly hotter (e.g., +5°C on nozzle) for best adhesion.	Ensure proper nozzle height (z-offset).
Retraction	1-2mm distance, 20-30mm/s speed for direct drive	TPU generally requires minimal retraction to prevent clogging and stringing. Start with low values, potentially slightly more for Bowden but tune carefully. Disable retraction during layer changes if stringing isn't an issue ("Wipe" settings can help).
Cooling Fan	Use moderate part cooling (e.g., 70-100%)	Too much cooling can weaken layer adhesion; too little can worsen overhangs and stringing. Start low and increase if needed.

Flow Rate (Extrusion Multiplier)	TPU often requires a slightly lower flow rate (e.g., 93-96%) than rigid filaments.	Calibrate for optimal results. Print a calibration cube or object to check dimensions and extrusion quality.

5. Post-Processing

Part Removal

1. Allow the bed to cool completely before attempting removal.
2. Flexing the build plate (if applicable) usually helps release the print.
3. Use a scraper carefully if needed.

Support Removal

Supports printed in TPU 64D can be challenging due to strong layer bonding.

1. Optimize support settings in your slicer (e.g., increase Z distance, use support interface layers with a compatible material if doing multi-material printing, reduce support density).
2. Use needle-nose pliers and flush cutters for removal. The rigidity of 64D might make supports snap off more cleanly than softer TPUs in some cases.

Finishing

1. TPU is difficult to sand effectively.

2. Use a sharp craft knife or deburring tool to carefully trim away strings, blobs, or support remnants.
3. Briefly applying heat (e.g., heat gun on low setting, very quick pass with a torch flame) can sometimes smooth surfaces or reduce fuzziness, but exercise extreme caution to avoid melting or burning the part.
4. Practice on test prints first.

6. Troubleshooting Common Issues

Stringing/Oozing	Dry filament thoroughly. Optimize retraction settings (distance, speed, Z-hop). Adjust print temperature (lower might help, but don't compromise layer adhesion). Increase travel speed. Use wipe/coast settings if available.
Clogging	Ensure filament is dry. Check for heat creep (ensure hotend fan is working). Increase nozzle temperature slightly within the recommended range. Clean the nozzle. Ensure extruder tension is appropriate (not too tight, not too loose).
Poor Bed Adhesion	Clean build plate. Adjust Z-offset (nozzle height). Increase bed temperature (within range). Use brim/raft.

	Apply bed adhesive (glue stick, Magigoo). Slow down first layer speed.
Weak Layer Adhesion	Dry filament thoroughly. Increase nozzle temperature. Decrease cooling fan speed. Ensure correct flow rate/extrusion multiplier.
Extrusion Issues (Under/Over)	Calibrate E-steps and flow rate. Check for partial clogs or restrictions in the filament path (including extruder gears and Bowden tube if applicable). Ensure filament spool can rotate freely.

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