

TECHNICAL DATA SHEET (TDS)

Thermoplastic Polyurethane (TPU) Filament – 98A

1. Product Identification

Parameter	Specification
Material Type	Thermoplastic Polyurethane (TPU)
Hardness	Shore A 98
Filament Diameter	1.75 mm
Processing Method	Fused Deposition Modeling (FDM / FFF)
Appearance	Solid / Translucent (depending on grade)

2. Mechanical Properties

Property	Typical Value	Test Method
Tensile Strength	45 – 55 MPa	ASTM D412 / ISO 37
Elongation at Break	300 – 400 %	ASTM D412 / ISO 37
Tear Strength	100 – 120 kN/m	ASTM D624
Hardness	98 Shore A	ASTM D2240
Abrasion Resistance	≤ 30 mm ³	ISO 4649
Compression Set (23°C, 24h)	≤ 25 %	ASTM D395

3. Physical Properties

Property	Typical Value	Test Method
Density	1.20 – 1.22 g/cm ³	ASTM D792
Melt Flow Index (190°C / 2.16 kg)	25 – 35 g/10 min	ASTM D1238
Moisture Absorption (24h)	≤ 0.6 %	ASTM D570

4. Thermal Properties

Property	Typical Value	Test Method
Glass Transition Temperature (T _g)	~ -25°C	DSC (ISO 11357)
Vicat Softening Temperature	100 – 120°C	ASTM D1525
Service Temperature Range	-25°C to 90°C	Internal

5. Printing Parameters (Recommended)

Parameter	Recommended Setting
Nozzle Temperature	220 – 250°C
Build Plate Temperature	40 – 60°C
Print Speed	30 – 70 mm/s
Retraction	Minimal
Cooling Fan	30 – 70 %
Nozzle Diameter	≥ 0.4 mm
Extruder Type	Direct Drive Recommended (Bowden compatible with tuning)

6. Rheological & Processing Notes

- TPU 98A offers higher stiffness compared to softer TPU grades, resulting in:
 - Improved feedability
 - Reduced filament buckling
- Exhibits viscoelastic flow behavior, requiring:

- Moderate extrusion pressure
 - Controlled retraction settings
 - More forgiving than TPU 85A and 65A in standard FDM systems
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7. Chemical Resistance

Exposure	Performance
Oils & Greases	Excellent
Fuels	Good
Aliphatic Hydrocarbons	Good
Acids (Dilute)	Moderate
UV Resistance	Moderate (UV stabilization recommended)
Water	Good

8. Applications

- Functional engineering parts
 - Automotive components (clips, covers, ducts)
 - Protective housings
 - Industrial seals and flexible connectors
 - Tooling aids and jigs
 - Drone and RC components
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9. Storage & Drying Conditions

Parameter	Recommendation
Storage Environment	Sealed, dry container
Relative Humidity	< 20 % RH
Drying Temperature	45 – 55°C
Drying Time	4 – 6 hours

Note: TPU is hygroscopic. Moisture can lead to:

- Surface defects (bubbles, stringing)
 - Reduced layer adhesion
 - Inconsistent extrusion
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10. Advantages & Limitations

Advantages

- High toughness and durability
- Excellent abrasion and wear resistance
- Easier printability compared to softer TPU grades
- Strong interlayer bonding

Limitations

- Less flexible than lower Shore hardness TPU
 - Moisture sensitive
 - Requires optimized cooling and extrusion settings
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11. Disclaimer

The data provided herein are typical values derived from laboratory testing and are intended for reference only. They should not be used as a guarantee of material performance. Users should conduct their own testing to determine suitability for specific applications and processing conditions.