

TECHNICAL DATA SHEET (TDS)

Thermoplastic Polyurethane (TPU) Filament – 75A

1. Product Identification

Parameter	Specification
Material Type	Thermoplastic Polyurethane (TPU)
Hardness	Shore A 75
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	20 – 30 MPa	ASTM D412 / ISO 37
Elongation at Break	500 – 650 %	ASTM D412 / ISO 37
Tear Strength	60 – 80 kN/m	ASTM D624
Hardness	75 Shore A	ASTM D2240
Abrasion Resistance	≤ 65 mm ³	ISO 4649
Compression Set (23°C, 24h)	≤ 35 %	ASTM D395

3. Physical Properties

Property	Typical Value	Test Method
Density	1.17 – 1.20 g/cm ³	ASTM D792
Melt Flow Index (190°C / 2.16 kg)	15 – 25 g/10 min	ASTM D1238
Moisture Absorption (24h)	≤ 0.9 %	ASTM D570

4. Thermal Properties

Property	Typical Value	Test Method
Glass Transition Temperature (T _g)	~ -32°C	DSC (ISO 11357)
Vicat Softening Temperature	75 – 95°C	ASTM D1525
Service Temperature Range	-32°C to 75°C	Internal Method

5. Printing Parameters (Recommended)

Parameter	Recommended Setting
Nozzle Temperature	215 – 245°C
Build Plate Temperature	40 – 60°C
Print Speed	15 – 40 mm/s
Retraction	Disabled or Minimal
Cooling Fan	20 – 50 %
Nozzle Diameter	≥ 0.4 mm (0.6 mm recommended)
Extruder Type	Direct Drive Strongly Recommended

6. Rheological & Processing Notes

- TPU 75A exhibits **high elasticity with moderate structural strength**
- Softer than 85A, therefore:
 - Increased risk of filament buckling
 - Higher sensitivity to extrusion pressure

- Recommended machine tuning:
 - Reduce print acceleration and jerk
 - Use constrained filament path
 - Optimize flow rate to prevent over-extrusion

7. Chemical Resistance

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

8. Applications

- Soft-touch consumer products
- Wearable components (bands, straps)
- Seals and flexible joints
- Vibration dampening parts
- Grip-enhanced tools and handles
- Protective padding components

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 may cause:

- Stringing and surface defects
 - Bubbling during extrusion
 - Reduced mechanical integrity
 - Poor layer adhesion
-

10. Advantages & Limitations

Advantages

- High flexibility and softness
- Excellent impact absorption
- Good layer bonding performance
- Suitable for soft functional parts

Limitations

- More difficult to print than TPU 85A / 98A
 - Sensitive to moisture
 - Requires slower print speeds and optimized extrusion
-

11. Disclaimer

The values provided in this Technical Data Sheet are **typical values obtained under controlled laboratory conditions** and are intended for reference only. They do not constitute a guarantee of performance. Users are responsible for determining the suitability of the material for their specific applications and processing conditions.