TRAK® MACHINE TOOLS
SOUTHWESTERN INDUSTRIES, INC.

Technical Data Sheet
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TPU 85A

Thermoplastic Urethane

With superior flexibility at 85A shore hardness, as well as abrasion resistance and chemical resistance, TPU 85A printing filament can be used for a multitude of applications in education, medicine, sports and environmental efforts. Excellent layer adhesion and strength means you can print functional belts for drives and gears as well.

Mechanical Properties	Standard	Value	Unit
Ultimate Tensile Strength	ASTM D638	26	MPa
Tensile Modulus	ASTM D638	12	MPa
Elongation at Break	ASTM D638	660	%
Flexural Strength			MPa
Flexural Modulus			MPa
Hardness Shore	**Standard**	**Value**	**Unit**
Hardness	ASTM D2240	85 Shore A	

Thermal Properties	Standard	Value	Unit
HDT @ 0.45 MPa	ASTM D648	44	°C
Glass Transition Temp	DSC	-35	°C
Physical Properties	**Standard**	**Value**	**Unit**
Density	ASTM D792	1.19	g/cm^3
Certifications and Tests	**Standard**	**Value**	**Unit**
Flammability (UL 94)			
USP Class VI Certified			

Characteristics

- Exceptional wear, tear and heat resistance
- High impact strength
- Easy formability, elastic and flexible
- Good corrosion resistance to many common industrial oils and chemicals (*see Chemical Resistance Table in Print Guide*)
- Shock absorption and vibration-dampening

Applications

- Industrial Manufacturing
- Functional Prototypes
- Aerospace, engineering, healthcare
- Seals, tubes, gaskets, grippers, end effectors
- Shoes and insoles
- Bushings, gaskets
- End-use parts
- Custom phone cases, rubber mats, and stress toys.
- Sports - applications that need strength, flexibility and plenty of impact strength.
- Healthcare - 3D-printed organs for pre-surgery prep and custom-designed prosthetics and orthotics to enhance patient care.
- Can be used for tires or shock absorbers and is even occasionally utilized to make O-rings and seals. In the world of DIY, TPU is fantastic for flexible parts or casings as well as parts that need to have resistance to sudden impacts and movement.
- In short, if you need to make a custom rubber piece quickly and relatively easily, TPU is your go-to material.

Considerations

- One downside to TPU is the printing speeds, which are rarely higher than 30 mm/s. This is because it's difficult to push the proper amount of filament through the hot end, resulting in prints taking a lot longer to complete.
- TPU doesn't produce any notable levels of fumes while printing, but it's not considered to be food safe. And though it's a non-soluble material, it is hygroscopic, meaning that it will slowly absorb moisture from its surroundings, affecting print quality.

Printing Skill & Experience: ☒ Beginner ☐ Intermediate ☐ Advanced ☒ Expert

- TPU has great elongation and stretchiness, but those properties can also cause some minor clogging and stringing.
- Can be a challenge to print for beginners due to its unique, high-performance properties
- Difficult to post-process because of its abrasion and chemical resistance.
- Requires installation of an SPFU on the 3ntr 3D Printers.

Printer Compatibility

☒ 3ntr A2v4	☒ 3ntr A4v4	☒ EVO-T	☒ EVO22-T

Available colors from TRAK: Black, Blue, Red, Natural
Available colors from Plural AM: Black, Blue, Clear
Available colors from Airwolf 3D: Fire, Grass, Midnight, Sapphire