

Technical data sheet TPU 95A

Ultimaker

Chemical Name	Thermoplastic polyurethane
Description	Highly versatile for industrial applications, TPU 95A filament is the go-to choice for a wide array of manufacturing projects that demand the qualities of both rubber and plastic. Designed for 3D printing consistency, TPU 95A is a semi-flexible and chemical resistant filament with strong layer bonding. In addition, it is easier and faster to print than other TPU filaments.
Key features	Exceptional wear and tear resistance, high impact strength, Shore-A hardness of 95, up to 580% elongation at break, and good corrosion resistance to many common industrial oils and chemicals.
Applications	Functional prototyping, grips, guides, hinges, sleeves, snap-fit parts and protective cases.
Non suitable for	Food contact applications and in-vivo applications. Long term UV and/or moisture immersion and applications where the printed part is exposed to high temperatures. Applications where the printed part is exposed to temperatures higher than 100 °C.

Filament specifications

Diameter	2.90±0.13 mm	2-axis laser gauge
Max roundness deviation	0.07 mm	2-axis laser gauge
Net filament weight	750 g	-

Color information

<u>Value</u>	<u>Method</u>
Color	Color code
TPU 95A White	RAL 9010

Mechanical properties (*)

Injection molding

3D printing

	Typical value	Test method	Typical value	Test method
Tensile modulus	-	-	26.0 MPa	ASTM D638
Tensile stress at yield	-	-	8.6 MPa	ASTM D638
Tensile stress at break	-	-	39.0 MPa	ASTM D638
Elongation at yield	-	-	55.0 %	ASTM D638
Elongation at break	-	-	580.0 %	ASTM D638
Flexural strength	-	-	4.3 MPa	ISO 179
Flexural modulus	-	-	78.7 MPa	ISO 179
Izod impact strength, notched (at 23°C)	-	-	19.1 J/m ²	ASTM D256
Charpy impact strength (at 23°C)	-	-	-	-
Hardness	-	-	95 (Shore A)	ASTM D2240
Abrasion resistance	-	-	0.06 g	ASTM D4060 (mass loss, 10000 cycles)

Thermal properties

Typical value

Test method

Melt mass-flow rate (MFR)	15.9 g/10min	ISO 1133 (225 °C, 1.2 kg)
Heat deflection (HDT) at 0.455 MPa	74 °C	ASTM D648
Heat deflection (HDT) at 1.82 MPa	49 °C	ASTM D648
Glass transition	-24 °C	DSC
Coefficient of thermal expansion (flow)	100·10 ⁻⁶ °C ⁻¹	ASTM E693
Coefficient of thermal expansion (xflow)	-	-
Melting temperature	220 °C	DSC
Thermal shrinkage	-	-

Electrical properties

Typical value

Test method

Volume resistivity	10 ¹¹ Ω·m	IEC 60093
Surface resistance	2·10 ¹⁴ Ω	IEC 60093

Other properties

Typical value

Test method

Specific gravity	1.22	ASTM D782
Flame classification	HB Class	ICE 60695-11-10
Moisture absorption	0.18 %	ASTM D570 (24h)

(*) See notes.

Notes

Properties reported here are average of a typical batch. The tensile test bars were printed with 2 shells, 107% material flow, nozzle temperature 260 °C, bed temperature 45 °C, nozzle diameter 0.8 mm, 40 mm/s infill speed, 30 mm/s print speed, and layer height 0.3 mm. The impact and heat deflection specimens were printed with 2 shells, nozzle temperature 245 °C, bed temperature 40 °C, nozzle diameter 0.5 mm, 40 mm/s infill speed, 30 mm/s print speed, and layer height 0.2 mm. The tensile bars were printed in the XY plane, using the normal quality profile in Cura 2.1, an UM2+, a 0.4 mm nozzle, 90% infill, 235 °C nozzle temperature and 70 °C build plate temperature. Ultimaker is constantly working on extending the TDS data.

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