

# Technical data sheet TPU 95A

**Ultimaker**  
It's in the making

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.

## Filament specifications

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

## Mechanical properties (\*)

	<u>Injection molding</u>		<u>3D printing</u>	
	<u>Typical value</u>	<u>Test method</u>	<u>Typical value</u>	<u>Test method</u>
Tensile modulus	-	-	26 MPa	ASTM D638
Tensile stress at yield	-	-	8.6 MPa	ASTM D638
Tensile stress at break	-	-	39 MPa	ASTM D638
Elongation at yield	-	-	55 %	ASTM D638
Elongation at break	-	-	580 %	ASTM D638
Flexural strength	-	-	-	-
Flexural modulus	-	-	-	-
Izod impact strength, notched (at 23°C)	-	-	19.1 J/m <sup>2</sup>	ASTM D256
Charpy impact strength (at 23°C)	-	-	-	-
Hardness	-	-	95 (Shore A)	ASTM D2240

## Thermal properties

	<u>Typical value</u>	<u>Test method</u>
Melt mass-flow rate (MFR)	-	-
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 <sup>-6</sup> °C <sup>-1</sup>	ASTM E693
Coefficient of thermal expansion (xflow)	-	-
Melting temperature	220 °C	DSC
Thermal shrinkage	-	-

## Electrical properties

	<u>Typical value</u>	<u>Test method</u>
Volume resistivity	10 <sup>11</sup> Ω·m	IEC 60093
Surface resistance	2·10 <sup>14</sup> Ω	IEC 60093

## Other properties

	<u>Typical value</u>	<u>Test method</u>
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. Ultimaker is constantly working on extending the TDS data.

## Disclaimer

Any technical information or assistance provided herein is given and accepted at your risk, and neither the Ultimaker or its affiliates make any warranty relating to it or because of it. Neither Ultimaker nor its affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product; and nothing herein waives any of Ultimaker's conditions of sale. Specifications are subject to change without notice.

Version

Version 3.003

Date

19/10/2016

**Ultimaker**  
It's in the making