

Ultrafuse® TPU 95A

Flexible | Fast printing |
Abrasion resistance

Extended TDS

Complete Technical Documentation
and Testing Summary

Contents

Technical Data Sheet 3

Biocompatibility..... 7

Are you looking for an updated TDS version? [Check out the latest online version here.](#)

Technical Data Sheet

Well-balanced profile of flexibility and durability that also allows for easier and faster printing.

Filament Properties

Filament Diameter	1.75 mm	2.85 mm
Diameter Tolerance	±0.050 mm	±0.1 mm
Roundness	±0.050 mm	±0.05 mm
Available Spool size	750 g, 2.5 kg	750 g, 2.5 kg
Available colors	Natural	

Filament Properties

Available Spool size	750 g	2.5 kg
Outer diameter	200 mm	300 mm
Inner diameter	50.5 mm	51.5 mm
Width	55 mm	103 mm

Recommended 3D-Print processing parameters

Used for test specimens

Printer	FFF printer	Prusa i3 MK3
Nozzle Temperature ¹⁾	210 – 230°C / 410 – 446°F	220°C / 428°F
Build Chamber Temperature	-	-
Bed Temperature	40°C / 104°F	40°C / 104°F
Bed Material	Glass	PEI coated sprint sheet
Nozzle Diameter	≥ 0.4 mm	0.4 mm
Print Speed	15 – 40 mm/s	25 mm/s
Max Volumetric Speed ²⁾	8 mm³/s	-

Please check your standard and/or high speed print profile availability for an easy start at www.forward-am.com.

¹ Fast printing might require an additional increase of the nozzle temperature; the stated printing speed is based on current validations. As equipment and technology continues to evolve, it is possible that even higher printing speeds may be attainable in the future.

² Based on Bambu Lab X1 C with a nozzle diameter of 0.4mm

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. Values in this document are average values, measured and calculated according to the instructions in the listed standards. The used specimens are produced with the Fused Filament Fabrication method. Measured values can vary depending on used print orientation and print parameters.

Please contact us for further product information, like for example REACH, RoHS, FCS.

The safety data given in this publication is for informational purposes only and does not constitute a legally binding MSDS. The relevant MSDS can be obtained upon request from your supplier or you may contact Mass Additive Manufacturing GmbH directly at sales@forward-am.com.

Process materials in a well-ventilated room, or use professional extraction systems.

Further Recommendations

Drying recommendations to ensure printability and best mechanical properties 70°C in a hot air dryer or vacuum oven for at least 5 hours Please note: To ensure constant material properties the material should always be kept dry.

Support material compatibility Ultrafuse® BVOH

General Properties	Standard	Average Values
Filament Density ³⁾	ISO 1183-1	1149 kg/m ³ / 72 lb/ft ³

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. Values in this document are average values, measured and calculated according to the instructions in the listed standards. The used specimens are produced with the Fused Filament Fabrication method. Measured values can vary depending on used print orientation and print parameters.

Please contact us for further product information, like for example REACH, RoHS, FCS.

The safety data given in this publication is for informational purposes only and does not constitute a legally binding MSDS. The relevant MSDS can be obtained upon request from your supplier or you may contact Mass Additive Manufacturing GmbH directly at sales@forward-am.com.

Process materials in a well-ventilated room, or use professional extraction systems.

³⁾ measured on filament

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. Values in this document are average values, measured and calculated according to the instructions in the listed standards. The used specimens are produced with the Fused Filament Fabrication method. Measured values can vary depending on used print orientation and print parameters.

Please contact us for further product information, like for example REACH, RoHS, FCS.

The safety data given in this publication is for informational purposes only and does not constitute a legally binding MSDS. The relevant MSDS can be obtained upon request from your supplier or you may contact Mass Additive Manufacturing GmbH directly at sales@forward-am.com.

Process materials in a well-ventilated room, or use professional extraction systems.

Tensile Properties ⁴⁾	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Tensile strength ⁵⁾	ISO 527	44.2 MPa	-	12.2 MPa
Elongation at Break ⁵⁾	ISO 527	661%	-	192%
Young's Modulus ⁶⁾	ISO 527	48.4 MPa	-	46.7 MPa
Stress at 50% Elongation ⁵⁾	ISO 527	8.3 MPa	-	7.9 MPa
Stress at 100% Elongation ⁵⁾	ISO 527	10.5 MPa	-	9.9 MPa
Stress at 300% Elongation ⁵⁾	ISO 527	20.3 MPa	-	-

Impact Properties ⁴⁾	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Impact Strength Charpy (notched)	ISO 179-2	No break	No break	16.8 kJ/m ²
Impact Strength Charpy (notched), -30°C	ISO 179-2	128 kJ/m ²	120 kJ/m ²	14.9 kJ/m ²
Impact Strength Izod (notched)	ISO 180	No break	No break	No break
Tensile Notched Impact Strength	ISO 8256/1	No break	No break	No break

Thermal Properties	Standard	Average Values
Vicat softening point at 50 N	ISO 306	< 27°C / < 81°F
Vicat softening point at 10 N	ISO 306	75°C / 167°F
Glass Transition Temperature	ISO 11357-2	-25°C / -13°F
Melting Temperature	ISO 11357-3	144°C / 291°F
Melt Volume-Flow Rate (MVR)	ISO 1133	20.7 cm ³ /10 min / 1.87 in ³ /10 min (210°C, 5 kg)

⁴ Conditioning of the specimens: Tempering (100°C, 20h), Standard climate (23°C, 50% RH 72h)

⁵ Testing speed: 200 mm/min

⁶ Testing speed: 1 mm/min

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. Values in this document are average values, measured and calculated according to the instructions in the listed standards. The used specimens are produced with the Fused Filament Fabrication method. Measured values can vary depending on used print orientation and print parameters.

Please contact us for further product information, like for example REACH, RoHS, FCS.

The safety data given in this publication is for informational purposes only and does not constitute a legally binding MSDS. The relevant MSDS can be obtained upon request from your supplier or you may contact Mass Additive Manufacturing GmbH directly at sales@forward-am.com.

Process materials in a well-ventilated room, or use professional extraction systems.

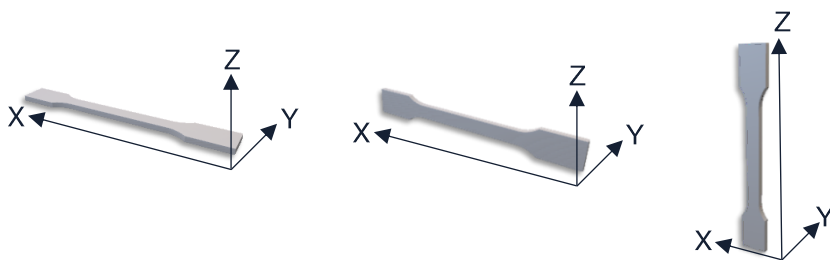
Mechanical Properties ⁷⁾	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Tear Strength	ISO 34-1, A	90 kN/m	8 kN/m	14 kN/m

Hardness and Abrasion	Standard	Average Values
Shore Hardness A (3s)	DIN ISO 7619-1	92
Shore Hardness D (15s)	DIN ISO 7619-1	45
Abrasion Resistance	DIN ISO 4649	64 mm ³ / 0.004 in ³
Compression Set at 23°C, 72 h	ISO 815	38%
Compression Set at 70°C, 24 h	ISO 815	90%

Biocompatibility	Standard	Typical Values
Cytotoxicity - Neutral Red	EN ISO 10993-5 (2009)	PASS ⁸⁾
Human Skin Irritation Test	EN ISO 10993-10 (2013)	PASS ⁸⁾
In vitro Sensitization Testing-KeratinoSens™	prEN ISO 10993-10 (2020)	PASS ⁸⁾

Print direction explanation

The orientation of the 3D printed part in the printer is always aligned with the longest axis first. The print direction is consistently along the Z-axis.



⁷ Conditioning of the specimens: Tempering (100°C, 20h), Standard climate (23°C, 50% RH 72h)

⁸ For the statement on Biocompatibility data see Chapter [Biocompatibility](#).

Biocompatibility

Product: Ultrafuse® TPU 95A

Revision: 28th of January 2025

3D printed test items of the above stated product have fulfilled the requirements of tests as stated below:

Cytotoxicity Testing- Neutral Red:

(EN ISO 10993-5 (2009))

Human Skin Irritation Test:

(EN ISO 10993-23 (2021))⁹

In vitro Sensitization Testing- KeratinoSens™

(prEN ISO 10993-10 (2020))

⁹ Patch test on 10 volunteers

The biocompatibility tests were recorded on test specimen of the referenced product to show compatibility of the material in general. The biocompatibility tests listed are not part of any continuous production protocol. The test assessments reflect only the test specimen and have to be retested on the final product. It remains the responsibility of the device manufacturers and /or end-users to determine the suitability of all printed parts for their respective application.

For notice:

We give no warranties, expressed or implied, concerning the suitability of mentioned product for use in any medical device and pharmaceutical applications. All information contained in this document is given in good faith and is based on sources believed to be reliable and accurate at the date of publication of this document. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed. The certificate is exclusively for our customers and respective competent authorities. It is not intended for publication either in printed or electronic form (e.g. via Internet) by others. Thus, neither partial nor full publication is allowed without written permission. This product information was generated electronically and is valid without signature.