Technical Data Sheet

Ultrafuse® TPU 64D

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Version No.: 2.0

General information

Components

BASF ether based thermoplastic polyurethane (TPU) based filament for Fused Filament Fabrication.

Product Description

Ultrafuse® TPU 64D is the hardest elastomer in BASF Forward AM's flexible productline. The material shows a relatively high rigidity while maintaining a certain flexibility.

This filament is the perfect match for industrial applications requiring rigid parts being resistant to impact, wear and tear. Due to its property profile, the material can be used as an alternative for parts made from ABS and rubbers.

Ultrafuse® TPU 64D is easy to print on direct drive and bowden style printers and is compatible with soluble BVOH support to realize the most complex geometries.

Delivery form and warehousing

Ultrafuse® TPU 64D filament should be stored at 15 - 25°C in its originally sealed package in a clean and dry environment. If the recommended storage conditions are observed the products will have a minimum shelf life of 12 months.

Product safety

Please process materials in a well ventilated room, or use professional air extraction systems. For further and more detailed information please consult the corresponding material safety data sheets.

Notice

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.

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	white and black	

Spool 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	Zaribo
Nozzle Temperature	230 – 255 °C / 446 – 491 °F	245 °C / 473 °F
Build Chamber Temperature	-	-
Bed Temperature	40 – 60 °C / 104 – 140 °F	55 °C / 131 °F
Bed Material	glass	glass
Nozzle Diameter	≥ 0.4 mm	0.4 mm
Print Speed	30 – 60 mm/s	50 mm/s

Please check your print profile availability for an easy start at www.forward-am.com.

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	Single material breakaway, Ultrafuse® BVOH, Ultrafuse® HIPS

General Properties		Standard
Filament Density*	1193 kg/m^3 / 74.5 lb/ft^3	ISO 1183-1

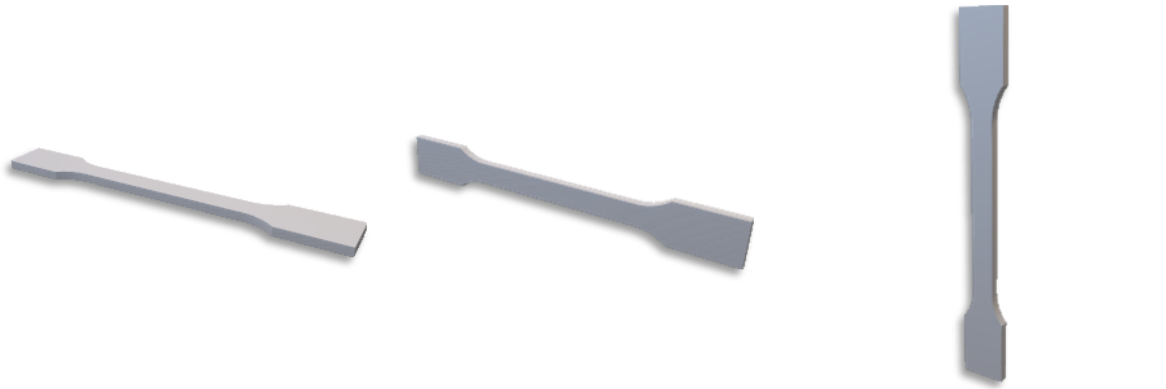
*measured on filament

Classification and Certification		Standard
Biocompatibility		
Cytotoxicity XTT neutral red	Passed	ISO 10993-5
Skin irritation	Passed	ISO10993-10
Skin sensitization LLNA KretinoSens	Passed	ISO10993-10

Thermal Properties		Standard
Vicat softening point @ 50 N	48 °C / 118 °F	ISO 306
Vicat softening point @ 10 N	126 °C / 259 °F	ISO 306
Glass Transition Temperature	-26 °C / 15 °F	ISO 11357-2
Melt Volume Rate	40.4 cm^3/10 min / 2.47 in^3/10 min (210 °C, 5 kg)	ISO 1133

General Mechanical Properties		Standard
Compression Set at 23°C, 72 h	25 %	ISO 815
Compression Set at 70°C, 24 h	55 %	ISO 815
Abrasion Resistance	43 mm^3 / 0.003 in^3	ISO 4649
Shore D Hardness (15 s)	58	ISO 7619-1

Mechanical Properties[1]



Print direction	Standard	XY	XZ	ZX
		Flat	On its edge	Upright
Stress at 50 % Elongation[2]	ISO 527	18 MPa / 2.61 ksi	-	17 MPa / 2.47 ksi
Stress at 100% Elongation[2]	ISO 527	21 MPa / 3.05 ksi	-	19 MPa / 2.76 ksi
Stress at 300% Elongation[2]	ISO 527	32 MPa / 4.46 ksi	-	-
Stress at Break, TPE[2]	ISO 527	37 MPa / 5.37 ksi	-	19 MPa / 2.76 ksi
Elongation at Break, TPE[2]	ISO 527	399 %	-	115 %
Young's Modulus[3]	ISO 527	205 MPa / 29.73 ksi	-	168 MPa / 24.37 ksi
Impact Strength Charpy (notched)	ISO 179-2	115 kJ/m^2	103 kJ/m^2	34 kJ/m^2
Impact Strength Charpy @-30 °C (notched)	ISO 179-2	4.1 kJ/m^2	4.8 kJ/m^2	2.6 kJ/m^2
Impact Strength Charpy @-30 °C (unnotched)	ISO 179-2	No break	No break	23.2 kJ/m^2
Impact Strength Izod (notched)	ISO 180	No break	No break	43 kJ/m^2
Tensile Notched Impact Strength	ISO 8256/1	No break	No break	No break
Tear Strength	ISO 34-1, A	66 kN/m	37 kN/m	79 kN/m

[1]Conditioning of the specimens: Tempering (100°C, 20h) Standard climate (23°C, 50% RH, 72h)
[2]testing speed: 200 mm/min
[3]testing speed: 1 mm/min