



Ultrafuse[®] PET CF15

strong | stiff | low abrasiveness

Extended TDS

Complete Technical Documentation and
Testing Summary

Version 1.4

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Technical Data Sheet

Easy to print strong and stiff filament with high dimensional stability.

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.

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

Filament Properties

Filament Diameter	1.75 mm	2.85 mm
Diameter Tolerance	±0.050 mm	±0.1 mm
Average ovality	<0.050 mm	<0.050 mm
Available Spool size	1.0 kg, 2.0 kg, 4.0 kg, 8.0 kg	1.0 kg, 2.0 kg, 4.0 kg, 8.0 kg
Available colors	black	

Spool Properties

Spool size	1.0 kg	2.0 kg	4.0 kg	8.0 kg
Outer diameter	200 mm	300 mm	350 mm	355 mm
Inner diameter	52 mm	51.5 mm	51.7 mm	36 mm
Width	68 mm	103 mm	103 mm	167 mm

Recommended 3D-Print processing parameters

Used for test specimens

Printer	FFF printer	Ultimaker S5
Nozzle Temperature ¹⁾	250 – 270 °C	275 °C
Build Chamber Temperature	-	-
Bed Temperature	65 – 85 °C	65 °C
Bed Material	Glass, PEI	Glass
Nozzle Diameter	≥ 0.6 mm	0.6 mm
Print Speed	30 - 80 mm/s	45 mm/s
Max Volumetric Speed ²⁾	8 mm ³ /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 of 300 mm/s 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 X1C with a nozzle diameter of 0.6 mm

Further Recommendations

Drying recommendations to ensure printability and best mechanical properties³⁾ 65 °C in a hot air dryer or vacuum oven 4 to 16 hours.

Support material compatibility Single material breakaway, Ultrafuse® BVOH

Warehousing Ultrafuse® PET CF15 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 24 months.

General Properties	Standard	Average Values
Filament Density ⁴⁾	ISO 1183-1	1357 kg/m ³

Tensile Properties ⁵⁾	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Tensile strength ⁶⁾	ISO 527	63.2 MPa	-	12.5 MPa
Elongation at Break ⁶⁾	ISO 527	3.7 %	-	0.5 %
Young's Modulus ⁷⁾	ISO 527	6178 MPa	-	2822 MPa

Flexural Properties ^{6) 8)}	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Flexural Strength	ISO 178	108 MPa	145 MPa	19.7 MPa
Flexural Modulus	ISO 178	5452 MPa	6293 MPa	2253 MPa
Flexural Elongation at Break	ISO 178	3.7 %	2.8 %	0.9 %

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³⁾ Please note: To ensure constant material properties the material should always be kept dry.

⁴⁾ measured on filament

⁵⁾ Samples were conditioned in standard climate (23°C, 50% RH 72h)

⁶⁾ Testing speed: 5 / 200 mm/min

⁷⁾ Testing speed: 1 mm/min

⁸⁾ Testing speed: 2 mm/min

Impact Properties ⁶⁾	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Impact Strength Charpy (notched)	ISO 179-2	5.4 kJ/m ²	4.8 kJ/m ²	0.5 kJ/m ²
Impact Strength Charpy (unnotched)	ISO 179-2	27.8 kJ/m ²	32.0 kJ/m ²	1.3 kJ/m ²
Impact Strength Izod (notched)	ISO 180	5.7 J/m	5.0 J/m	2.0 J/m
Impact Strength Izod (unnotched)	ISO 180	25.1 J/m	22.6 J/m	2.4 J/m

For the diagrams on mechanical properties see Chapter: [Mechanical Properties Diagrams](#)

Thermal Properties ⁶⁾	Standard	Average Values
HDT A at 1.8 MPa	ISO 75-2	72 °C
HDT B at 0.45 MPa	ISO 75-2	74 °C
Vicat softening point at 50 N	ISO 306	203 °C
Vicat softening point at 10 N	ISO 306	243 °C
Glass Transition Temperature	ISO 11357-2	79 °C
Crystallization Temperature	ISO 11357-3	204 °C
Melting Temperature	ISO 11357-3	245 °C
Melt Volume-Flow Rate (MVR)	ISO 1133	25 cm ³ /10 min (260 °C, 2.16 kg)

Hardness and Abrasion	Standard	Typical Values
Shore Hardness D (15s)	DIN ISO 7619-1	67

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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.

