forward am
run by Mass Additive Manufacturing

Ultrafuse® PP GF30

chemical resistant | stiff | UV resistant

Extended TDS

Complete Technical Documentation and Testing Summary

Version 1.3

Contents

Technical Data Sheet 3

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Technical Data Sheet

Reinforced filament with 30% glass fiber, specially designed for 3D-printing.

Filament Properties		
Filament Diameter	1.75 mm	2.85 mm
Average diameter Tolerance	±0.050 mm	±0.1 mm
Average ovality	<0.050 mm	<0.050 mm
Available Spool size	700 g, 2.2 kg	700 g, 2.2 kg
Available colors	black	

Spool Properties					
Spool size	750 g	750 g New Spool	2.0 kg	4.0 kg	8.0 kg
Outer diameter	200 mm	200 mm	300 mm	350 mm	355 mm
Inner diameter	50.5 mm	52 mm	51.5 mm	51.7 mm	36 mm
Width	55 mm	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)]	240 – 260°C	280 °C
Build Chamber Temperature	-	Passively heated (cover)
Bed Temperature	20 – 40°C	90 °C
Bed Material	PP GF adhesive or PP tape	Glass + Magigoo PPGF
Nozzle Diameter	≥ 0.6 mm	0.6 mm
Print Speed	30 - 80 mm/s	40 mm/s
Max Volumetric Speed[2)]	16 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 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

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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.

Further Recommendations	
Drying recommendations to ensure printability and best mechanical properties[3]	60 °C in a hot air dryer or vacuum oven for 4 to 16 hours
Warehousing	Ultrafuse® PP GF30 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.

General Properties	Standard	Average Values
Filament Density[4]	ISO 1183-1	1036 kg/m³

Tensile Properties[5]	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Tensile strength[6]	ISO 527	41.7 MPa	-	15.9 MPa
Elongation at Break[6]	ISO 527	4.4 %	-	0.8 %
Young's Modulus[7]	ISO 527	2628 MPa	-	2242 MPa

Flexural Properties[6] [8]	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Flexural Strength	ISO 178	76.8 MPa	95.3 MPa	19.3 MPa
Flexural Modulus	ISO 178	3507 MPa	4026 MPa	1671 MPa
Flexural Elongation at Break	ISO 178	4.6 %	3.3 %	1.3 %

[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 mm/min
[7] Testing speed: 1 mm/min
[8] Testing speed: 2 mm/min

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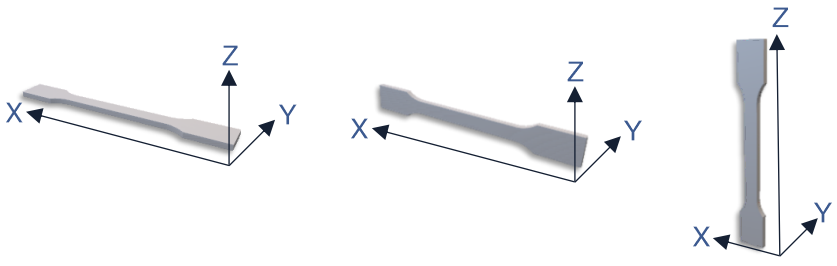
Impact Properties[6]	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Impact Strength Charpy (notched)	ISO 179-2	5.3 kJ/m²	5.2 kJ/m²	1.2 kJ/m²
Impact Strength Charpy (unnotched)	ISO 179-2	23.1 kJ/m²	25.8 kJ/m²	2.5 kJ/m²
Impact Strength Izod (notched)	ISO 180	5.6 J/m	6.2 J/m	1.4 J/m
Impact Strength Izod (unnotched)	ISO 180	20.5 J/m	2.4 J/m	2.6 J/m

Thermal Properties[6]	Standard	Average Values
HDT A at 1.8 MPa	ISO 75-2	117 °C
HDT B at 0.45 MPa	ISO 75-2	148 °C
Vicat softening point at 50 N	ISO 306	138 °C
Vicat softening point at 10 N	ISO 306	164 °C
Crystallization Temperature		125 °C
Glass Transition Temperature	ISO 11357-2	-5 °C
Melting Temperature	ISO 11357-3	158 °C
Melt Volume-Flow Rate (MVR)	ISO 1133	11.7 cm³/10 min (220 °C, 2,16 kg)

Hardness and Abrasion	Standard	Typical Values
Shore Hardness D (15s)	DIN ISO 7619-1	73

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.



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