



Ultrafuse[®] PA6 GF30

reinforced | stiff | strong

Extended TDS

Complete Technical Documentation and
Testing Summary

Version 1.5

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Technical Data Sheet

Glass fiber reinforced Polyamide 6 filament with extreme stiffness and strength for demanding 3D printing applications.

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, 2.0 kg	700 g, 2.0 kg
Available colors	black	

Spool Properties

Spool size	700/750 g	1.0 kg	2.0 kg	4.0 kg	8.0 kg
Outer diameter	200 mm	200 mm	300 mm	350 mm	355 mm
Inner diameter	52 mm	52 mm	51.5 mm	51.7 mm	36 mm
Width	68 mm	68 mm	103 mm	103 mm	167 mm

Recommended 3D-Print processing parameters

Used for test specimens

Printer	FFF printer	Raise 3D Pro2
Nozzle Temperature ¹⁾	240 – 280 °C	250 °C
Build Chamber Temperature	passively heated, closed chamber	-
Bed Temperature	70 – 100 °C	95 °C
Bed Material	glass	PEI
Nozzle Diameter	≥ 0.6 mm	0.6 mm
Print Speed	30 - 60 mm/s	60 mm/s
Max Volumetric Speed ²⁾	15 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 properties³⁾

100 °C in a hot air dryer or vacuum oven for 4 to 16 hours.

Support material compatibility

Single material breakaway, Ultrafuse® BVOH

Warehousing

Ultrafuse® PA6 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 24 months.

General Properties**Standard****Average Values**

Filament Density⁴⁾

ISO 1183-1

1356 kg/m³

Tensile Properties⁵⁾**Standard****Average Values**

**XY-
Direction**

**XZ-
Direction**

**ZX-
Direction**

Tensile strength⁶⁾
conditioned⁷⁾

ISO 527

46.4 MPa

-

12.2 MPa

Tensile strength⁶⁾ dry⁸⁾

ISO 527

78.3 MPa

-

14.9 MPa

Elongation at Break⁶⁾
conditioned⁷⁾

ISO 527

3.2 %

-

1.9 %

Elongation at Break⁶⁾ dry⁸⁾

ISO 527

2.2 %

-

0.8 %

Young's Modulus⁹⁾
conditioned⁷⁾

ISO 527

2469 MPa

-

1156 MPa

Young's Modulus⁹⁾ dry⁸⁾

ISO 527

5036 MPa

-

2380 MPa

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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 mm/min

⁷ Samples were conditioned in standard climate (23°C, 50% RH 72h)

⁸ Samples were dried at 80°C vacuum until weight constancy

⁹ Testing speed: 1 mm/min

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Flexural Properties ^{6) 10)}	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Flexural Strength conditioned ⁷⁾	ISO 178	80.2MPa	130.0 MPa	29.1 MPa
Flexural Strength dry ⁸⁾	ISO 178	147.4 MPa	188.2 MPa	44.2 MPa
Flexural Modulus conditioned ⁷⁾	ISO 178	2861 MPa	4301 MPa	1070 MPa
Flexural Modulus dry ⁸⁾	ISO 178	4694 MPa	8103 MPa	2371 MPa
Flexural Elongation at Break conditioned ⁷⁾	ISO 178	11.6 %	6.5 %	5.3 %
Flexural Elongation at Break dry ⁸⁾	ISO 178	4.0 %	2.7 %	2.0 %

Impact Properties ⁶⁾	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Impact Strength Charpy (notched) conditioned ⁷⁾	ISO 179-2	17.0 kJ/m ²	20.9 kJ/m ²	2.7 kJ/m ²
Impact Strength Charpy (notched) dry ⁸⁾	ISO 179-2	8.9 kJ/m ²	16.2 kJ/m ²	-
Impact Strength Charpy (unnotched) conditioned ⁷⁾	ISO 179-2	41.8 kJ/m ²	48.8 kJ/m ²	3.1 kJ/m ²
Impact Strength Charpy (unnotched) dry ⁸⁾	ISO 179-2	38.9 kJ/m ²	45.5 kJ/m ²	2.2 kJ/m ²
Impact Strength Izod (notched) conditioned ⁷⁾	ISO 180	20.9 J/m	19.0 J/m	2.7 J/m
Impact Strength Izod (notched) dry ⁸⁾	ISO 180	9.2 J/m	13.4 J/m	-
Impact Strength Izod (unnotched) conditioned ⁷⁾	ISO 180	36.9 J/m	41.4 J/m	3.8 J/m
Impact Strength Izod (unnotched) dry ⁸⁾	ISO 180	38.4 J/m	28.7 k/m	2.6 J/m

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

¹⁰ Testing speed: 2 mm/min

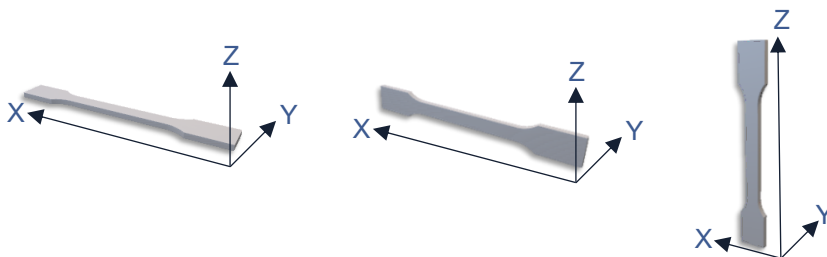
Thermal Properties ⁶⁾	Standard	Average Values
HDT A at 1.8 MPa conditioned ⁷⁾	ISO 75-2	146 °C
HDT A at 1.8 MPa dry ⁸⁾	ISO 75-2	152 °C
HDT B at 0.45 MPa conditioned ⁷⁾	ISO 75-2	186 °C
HDT B at 0.45 MPa dry ⁸⁾	ISO 75-2	189 °C
Vicat softening point at 50 N conditioned ⁷⁾	ISO 306	163 °C
Vicat softening point at 50 N dry ⁸⁾	ISO 306	192 °C
Vicat softening point at 10 N conditioned ⁷⁾	ISO 306	183 °C
Vicat softening point at 10 N dry ⁸⁾	ISO 306	199 °C
Glass Transition Temperature	ISO 11357-2	67 °C
Crystallization Temperature	ISO 11357-3	167 °C
Melting Temperature	ISO 11357-3	209 °C
Melt Volume-Flow Rate (MVR)	ISO 1133	58.3 cm ³ /10 min (275°C, 5 kg)

For the diagrams on thermal properties see Chapter: [Thermal Properties Diagrams](#).

Fire, Smoke, Toxicity (FST) properties ⁶⁾	Standard	Average Values
Flame class rating	UL 94	HB (1.6 mm) HB (3.1 mm)

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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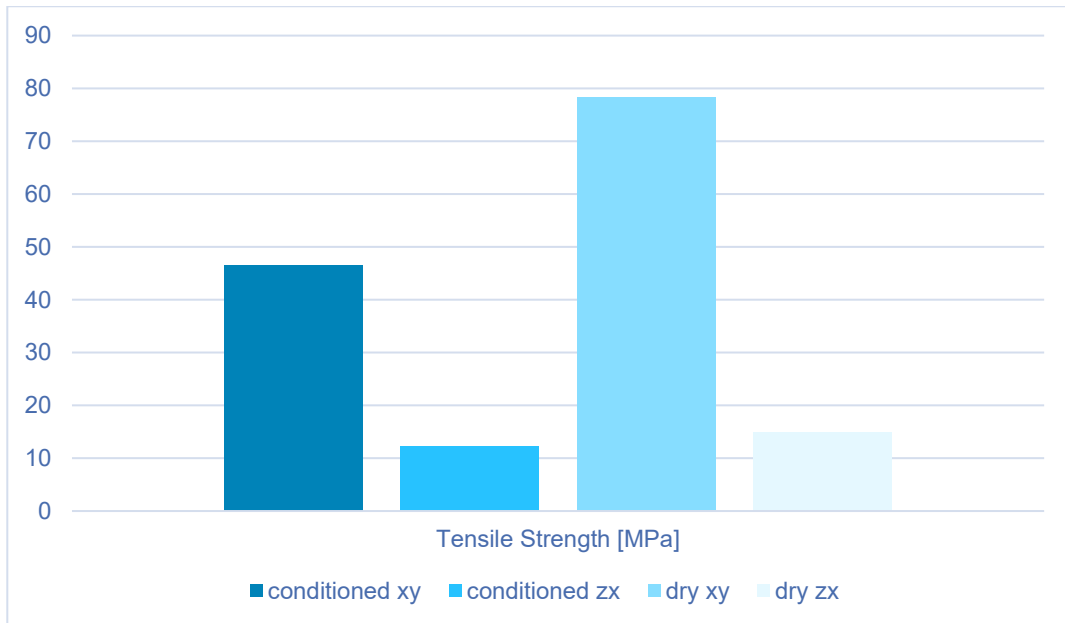
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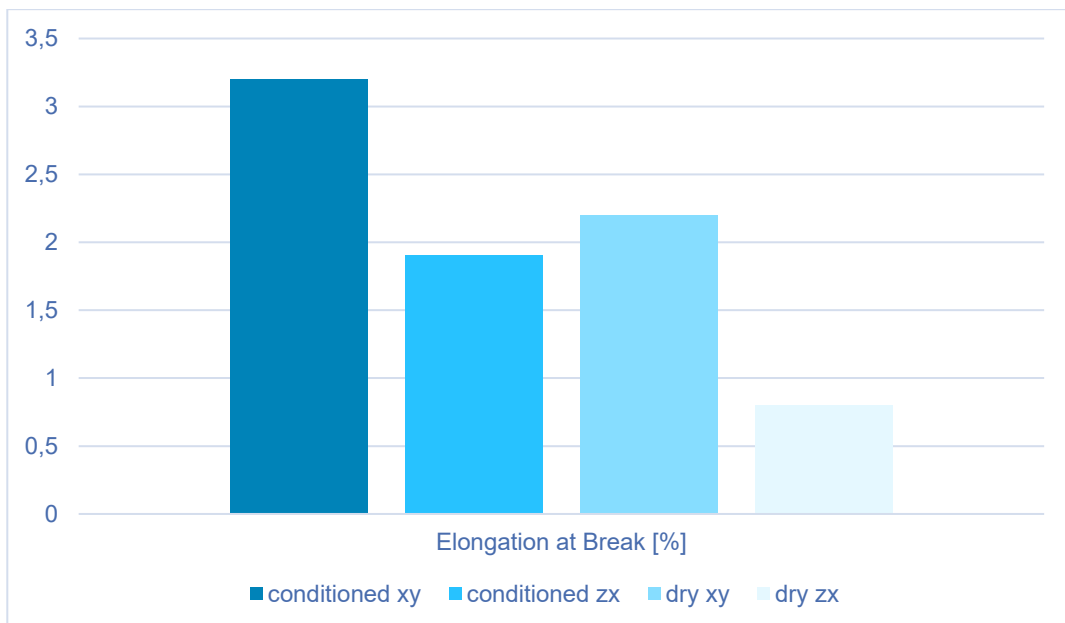
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Mechanical Properties Diagrams

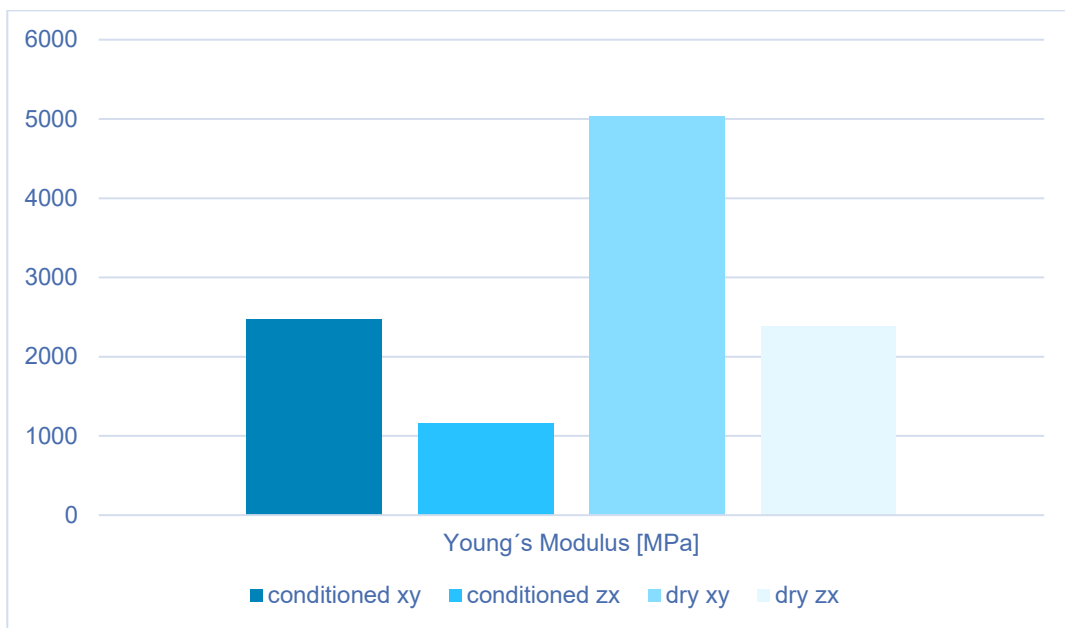
Tensile Strength



Tensile strength comparison Ultrafuse® PA6 GF30 conditioned and dry



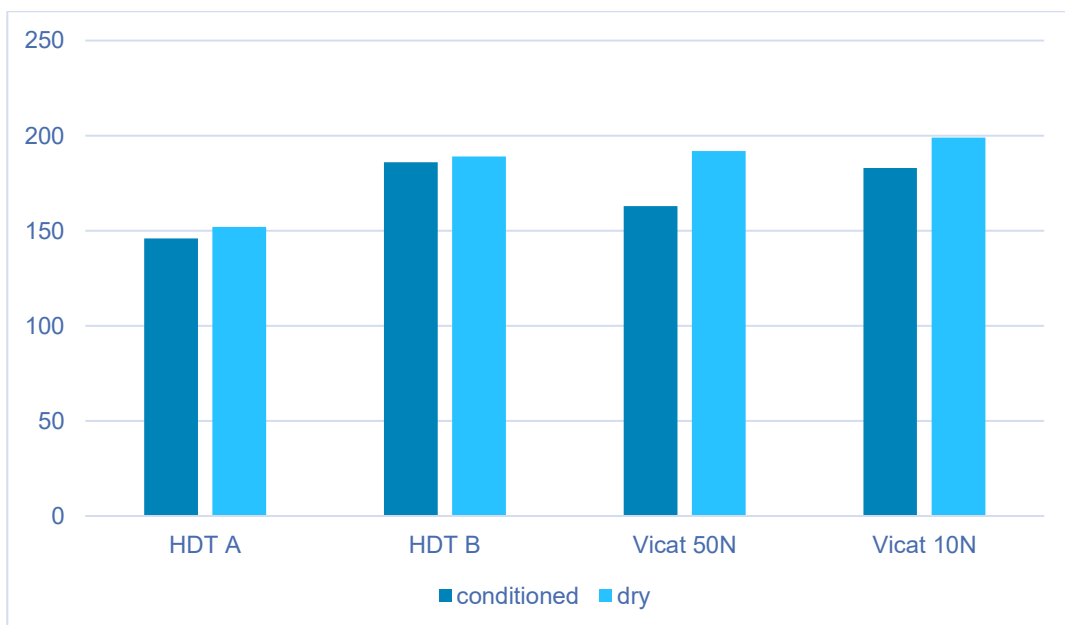
Elongation at Break comparison Ultrafuse® PA6 GF30 conditioned and dry



Young's Modulus comparison Ultrafuse® PA6 GF30 conditioned and dry

Thermal Properties Diagrams

HDT and Vicat



Heat resistance of Ultrafuse® PA6 GF30