



Ultrafuse[®] PA6 GF30

reinforced | stiff | strong

Extended TDS

Complete Technical Documentation and
Testing Summary

Contents

Technical Data Sheet	3
Mechanical Propertie Diagrams.....	7
Thermal Properties Diagrams	8
Are you looking for an updated TDS version? Check out the latest online version here.	

Technical Data Sheet

Glass fiber reinforced 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, 2.2 kg	700 g, 2.2 kg
Available colors	black	

Spool Properties				
Spool size	750 g	2.0 kg	4.0 kg	8.0 kg
Outer diameter	200 mm	300 mm	350 mm	355 mm
Inner diameter	50.5 mm	51.5 mm	51.7 mm	36 mm
Width	55 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 / 464 – 536 °F	250 °C
Build Chamber Temperature	passively heated, closed chamber	-
Bed Temperature	70 – 100 °C / 158 – 212 °F	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

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 Forward AM Technologies 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 properties³⁾ 100 °C in a hot air dryer or vacuum oven for 4 to 16 hours

Support material compatibility Ultrafuse® BVOH

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

Filament Density⁴⁾ ISO 1183-1 1356 kg/m³

Tensile Properties⁵⁾**Standard****Average Values****XY-
Direction⁶⁾****XZ-
Direction⁷⁾****ZX-
Direction⁸⁾**

Tensile strength⁹⁾ conditioned¹⁰⁾ ISO 527 46.4 MPa - 12.2 MPa

Tensile strength⁹⁾ dry¹¹⁾ ISO 527 78.3 MPa - 14.9 MPa

Elongation at Break⁹⁾ conditioned¹⁰⁾ ISO 527 3.2 % - 1.9 %

Elongation at Break⁹⁾ dry¹¹⁾ ISO 527 2.2 % - 0.8 %

Young's Modulus¹²⁾ conditioned¹⁰⁾ ISO 527 2469 MPa - 1156 MPa

Young's Modulus¹²⁾ dry¹¹⁾ ISO 527 5036 MPa - 2380 MPa

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 Forward AM Technologies GmbH directly at sales@forward-am.com.

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

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⁾ 

⁷⁾ 

⁸⁾ 

⁹⁾ Testing speed: 5 mm/min

¹⁰⁾ Samples were conditioned in standard climate (23°C, 50% RH 72h)

¹¹⁾ Samples were dried at 80°C vacuum until weight constancy

¹²⁾ Testing speed: 1 mm/min

Flexural Properties ^{6) 13)}	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Flexural Strength conditioned ¹⁰⁾	ISO 178	80.2MPa	130.0 MPa	29.1 MPa
Flexural Strength dry ¹¹⁾	ISO 178	147.4 MPa	188.2 MPa	44.2 MPa
Flexural Modulus conditioned ¹⁰⁾	ISO 178	2861 MPa	4301 MPa	1070 MPa
Flexural Modulus dry ¹¹⁾	ISO 178	4694 MPa	8103 MPa	2371 MPa
Flexural Elongation at Break conditioned ¹⁰⁾	ISO 178	11.6 %	6.5 %	5.3 %
Flexural Elongation at Break dry ¹¹⁾	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 ¹⁰⁾	ISO 179-2	17.0 kJ/m ²	20.9 kJ/m ²	2.7 kJ/m ²
Impact Strength Charpy (notched) dry ¹¹⁾	ISO 179-2	8.9 kJ/m ²	16.2 kJ/m ²	-
Impact Strength Charpy (unnotched) conditioned ¹⁰⁾	ISO 179-2	41.8 kJ/m ²	48.8 kJ/m ²	3.1 kJ/m ²
Impact Strength Charpy (unnotched) dry ¹¹⁾	ISO 179-2	38.9 kJ/m ²	45.5 kJ/m ²	2.2 kJ/m ²
Impact Strength Izod (notched) conditioned ¹⁰⁾	ISO 180	20.9 kJ/m ²	19.0 kJ/m ²	2.7 kJ/m ²
Impact Strength Izod (notched) dry ¹¹⁾	ISO 180	9.2 kJ/m ²	13.4 kJ/m ²	-
Impact Strength Izod (unnotched) conditioned ¹⁰⁾	ISO 180	36.9 kJ/m ²	41.4 kJ/m ²	3.8 kJ/m ²
Impact Strength Izod (unnotched) dry ¹¹⁾	ISO 180	38.4 kJ/m ²	28.7 kJ/m ²	2.6 kJ/m ²

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

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 Forward AM Technologies GmbH directly at sales@forward-am.com.

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

¹³ Testing speed: 2 mm/min

Thermal Properties ⁶⁾	Standard	Average Values
HDT A at 1.8 MPa conditioned ¹⁰⁾	ISO 75-2	87 °C
HDT A at 1.8 MPa dry ¹¹⁾	ISO 75-2	82 °C
HDT B at 0.45 MPa conditioned ¹⁰⁾	ISO 75-2	114 °C
HDT B at 0.45 MPa dry ¹¹⁾	ISO 75-2	110 °C
Vicat softening point at 50 N conditioned ¹⁰⁾	ISO 306	163 °C
Vicat softening point at 50 N dry ¹¹⁾	ISO 306	192 °C
Vicat softening point at 10 N conditioned ¹⁰⁾	ISO 306	183 °C
Vicat softening point at 10 N dry ¹¹⁾	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)

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.

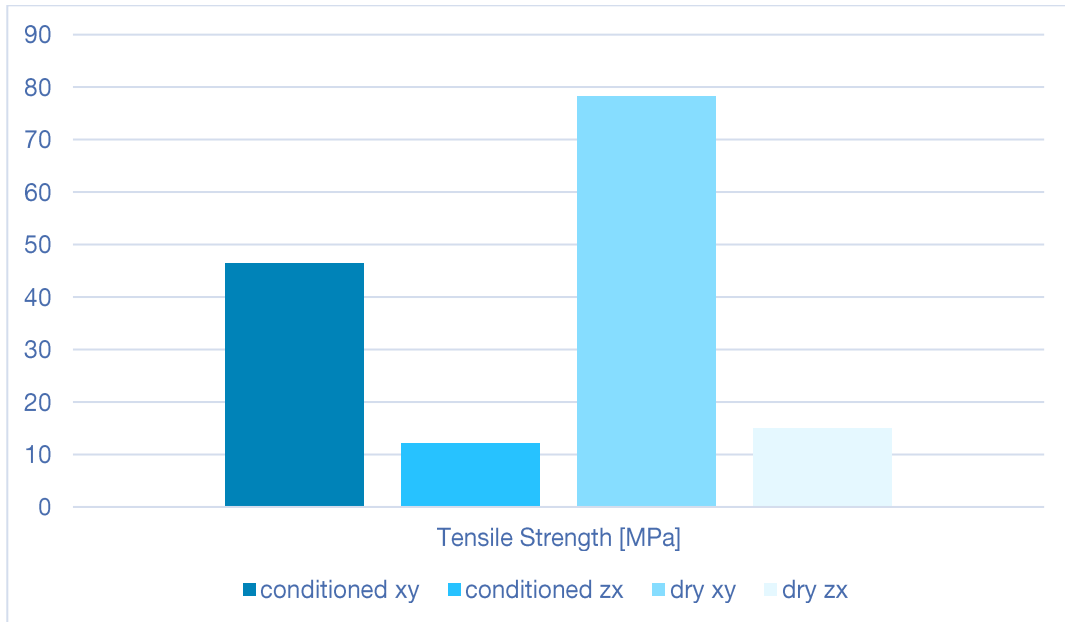
Please contact us for further product information, like for example REACH, RoHS, FCS.

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 Forward AM Technologies GmbH directly at sales@forward-am.com.

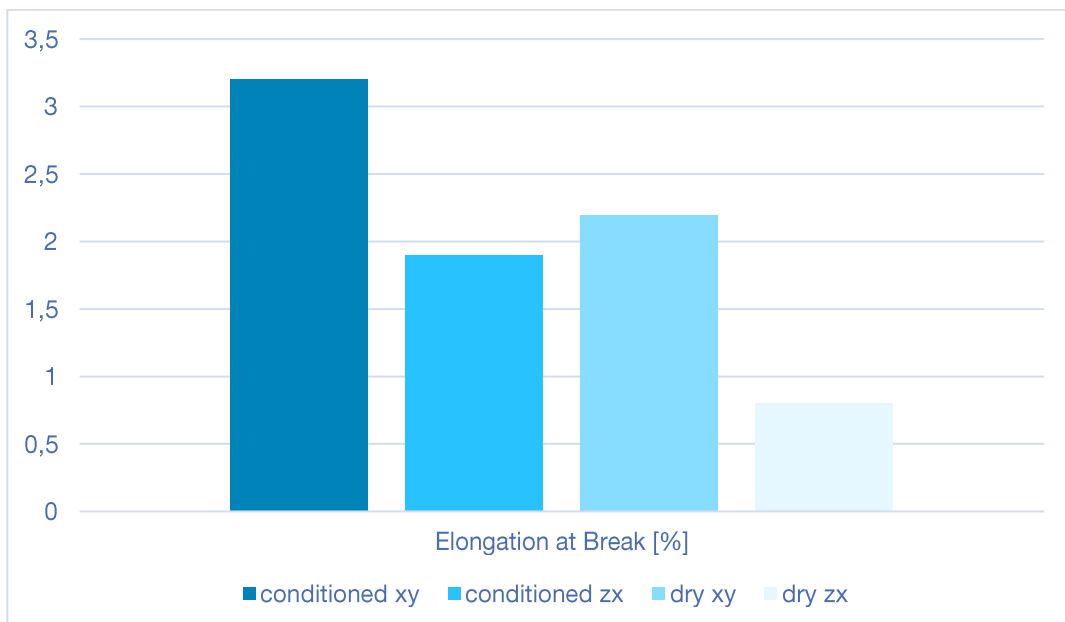
Process materials in a well-ventilated room, or use professional extraction systems.

Mechanical Properties Diagrams

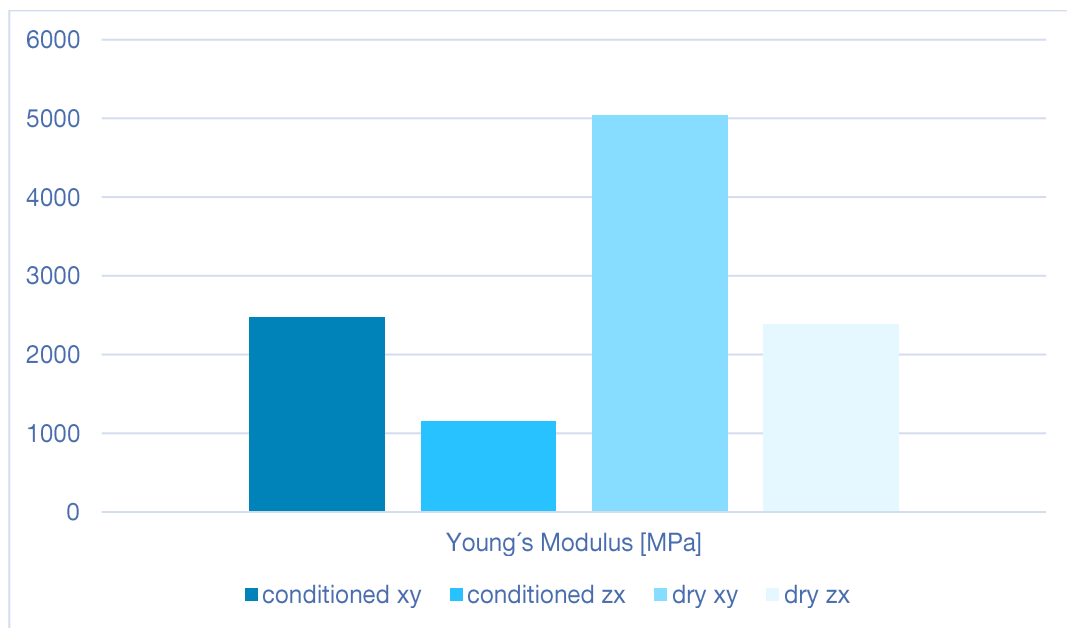
Tensile Strength



Tensile strength comparison Ultrafuse® PA6 GF30 conditioned and dry



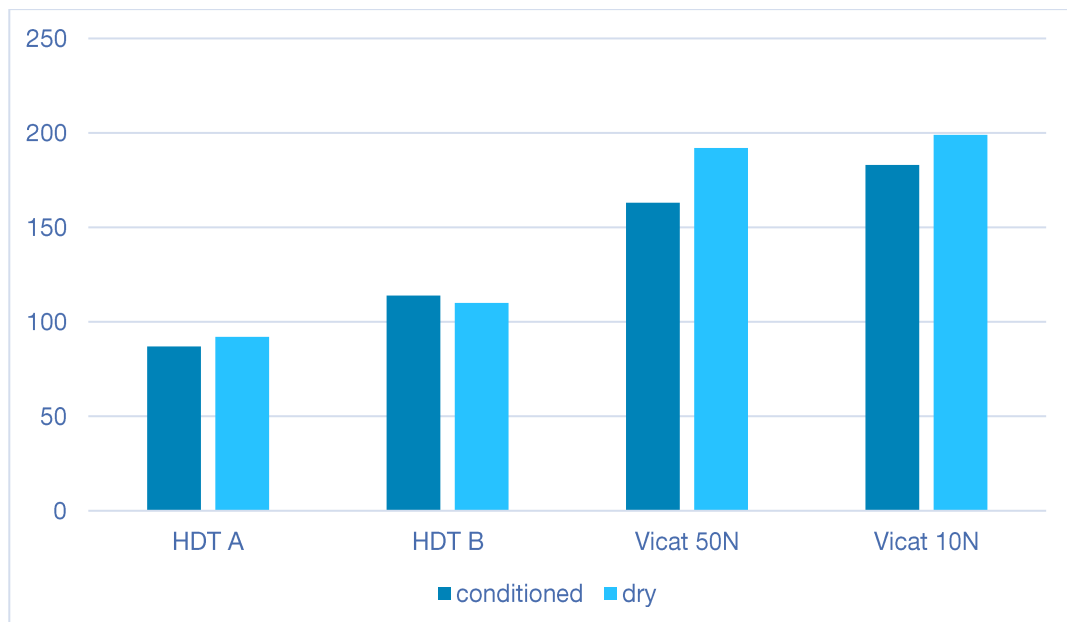
Elongation at Break comparison Ultrafuse® PA6 GF30 conditioned and dry



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

Thermal Properties Diagrams

HDT and Vicat



Heat resistance of Ultrafuse® PA6 GF30