

# Technical Data Sheet

# Ultrafuse® PA6 GF30

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Version No.: 2.1

## General information

### Components

Polyamide based filament filled with 30% glass fibers for Fused Filament Fabrication.

### Product Description

Ultrafuse® PA6 GF30 is polyamide, reinforced with 30% glass fiber content. The fibers in this material are specially designed for 3D-printing filaments and are compatible with a wide range of FFF 3D-printers. The extreme stiffness and strength make this material highly suitable for demanding applications. Ultrafuse® PA6 GF30 has a good chemical and wear resistance. With its excellent layer adhesion and the low warping, it is designed to be easy to use and suitable for a wide range of applications

### Delivery form and 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 12 months.

### Product safety

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

### For your information

When melted, Ultrafuse® PA6 GF30 filament can be abrasive due to its glass reinforcement. Printing with Ultrafuse® PA6 GF30 may reduce brass nozzles and extruder driving wheels' lifetime. For a better experience, using hardened steel nozzles and extruder driving wheels is advised.

### Disclaimer

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	±0.075 mm
Roundness	±0.050 mm	±0.075 mm
Available Spool size	700 g, 2200g	700 g, 2200g
Available colors	black	

Spool Properties		
Available Spool size	700 g	2200 g
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	Raise 3D Pro2
Nozzle Temperature	240 – 280 °C / 464 – 536 °F	250 °C / 482 °F
Build Chamber Temperature	passively heated, closed chamber	passively heated, closed chamber
Bed Temperature	70 – 100 °C / 158 – 212 °F	95 °C / 203 °F
Bed Material	Glass	PEI
Nozzle Diameter	≥ 0.6 mm	0.6 mm
Print Speed	30 - 60 mm/s	60 mm/s

Please check your print profile availability for an easy start at [www.forward-am.com](http://www.forward-am.com).

Further Recommendations	
Drying recommendations to ensure printability and best mechanical properties	100 °C in a hot air dryer or vacuum oven for at least 8 to 10 hours. Please note: To ensure constant material properties the material should always be kept dry.
Support material compatibility	Ultrafuse® BVOH

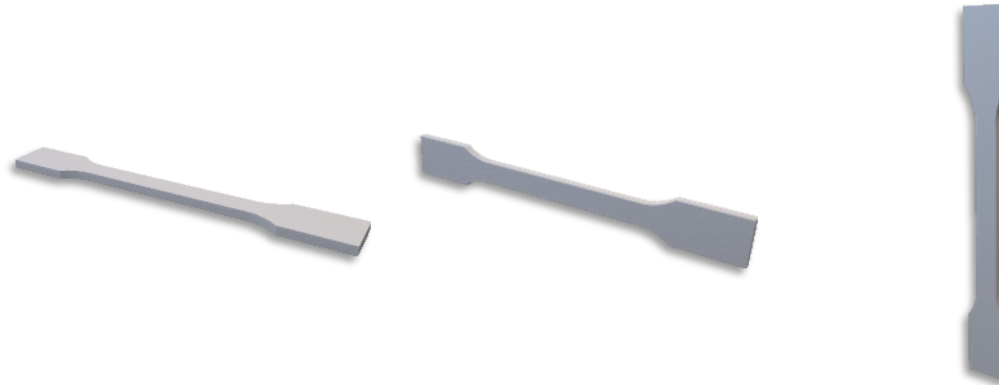
General Properties		Standard
Filament Density <sup>1</sup>	1356 kg/m <sup>3</sup> / 84.7 lb/ft <sup>3</sup>	ISO 1183-1

Thermal Properties		Standard
HDT at 1.8 MPa <sup>1</sup>	82 °C / 179.6 °F	ISO 75-2
HDT at 0.45 MPa <sup>1</sup>	110 °C / 230 °F	ISO 75-2
Vicat softening point @ 50 N <sup>1</sup>	192 °C / 377.6 °F	ISO 306
Vicat softening point @ 10 N <sup>1</sup>	199 °C / 390.2 °F	ISO 306
Glass Transition Temperature	67 °C / 152.6 °F	ISO 11357-2
Crystallization Temperature	167 °C / 332.6 °F	ISO 11357-3
Melting Temperature	209 °C / 408.2 °F	ISO 11357-3
Melt Volume Rate	58.3 cm <sup>3</sup> /10 min / 3.56 in <sup>3</sup> /10 min (275 °C, 5 kg)	ISO 1133
Flame class rating	HB @ 1.6 mm and 3.1 mm thickness	UL 94

<sup>1</sup>Conditioning of the sample: dried (80°C, 504h)

**Mechanical Properties<sup>1</sup> | Dried specimens**



Print direction	Standard	XY Flat	XZ On its edge	ZX Upright
Tensile strength <sup>2</sup>	ISO 527	78.3 MPa / 11.4 ksi	-	14.9 MPa / 2.2 ksi
Elongation at Break <sup>2</sup>	ISO 527	2.2 %	-	0.8 %
Young's Modulus <sup>3</sup>	ISO 527	5036 MPa / 730.4 ksi	-	2380 MPa / 345.2 ksi
Flexural Strength <sup>4</sup>	ISO 178	147.4 MPa / 21.4 ksi	188.2 MPa / 27.3 ksi	44.2 MPa / 6.4 ksi
Flexural Modulus <sup>4</sup>	ISO 178	4694 MPa / 680.8 ksi	8103 MPa / 1175.2 ksi	2371 MPa / 343.9 ksi
Flexural Elongation at Break <sup>4</sup>	ISO 178	4.0 %	2.7 %	2.0 %
Impact Strength Charpy (notched)	ISO 179-2	8.9 kJ/m <sup>2</sup>	16.2 kJ/m <sup>2</sup>	-
Impact Strength Charpy (unnotched)	ISO 179-2	38.9 kJ/m <sup>2</sup>	45.5 kJ/m <sup>2</sup>	2.2 kJ/m <sup>2</sup>
Impact Strength Izod (notched)	ISO 180	9.2 kJ/m <sup>2</sup>	13.4 kJ/m <sup>2</sup>	-
Impact Strength Izod (unnotched)	ISO 180	38.4 kJ/m <sup>2</sup>	38.7 kJ/m <sup>2</sup>	2.6 kJ/m <sup>2</sup>

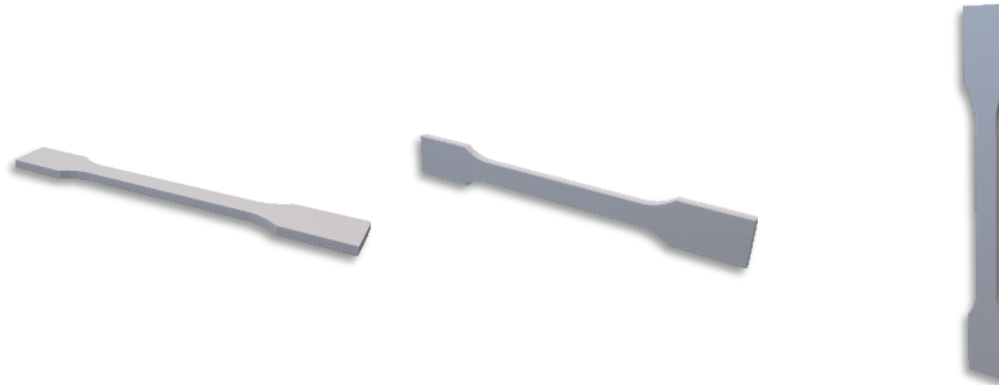
<sup>1</sup>Conditioning of the specimens: dried (80°C, 504h)

<sup>2</sup>testing speed: 5 mm/min

<sup>3</sup>testing speed: 1 mm/min

<sup>4</sup>testing speed: 2 mm/min

**Mechanical Properties<sup>1</sup> | conditioned specimens**



Print direction	Standard	XY Flat	XZ On its edge	ZX Upright
Tensile strength <sup>2</sup>	ISO 527	46.4 MPa / 6.7 ksi	-	12.2 MPa / 1.8 ksi
Elongation at Break <sup>2</sup>	ISO 527	3.2 %	-	1.9 %
Young's Modulus <sup>3</sup>	ISO 527	2469 MPa / 358.1 ksi	-	1156 MPa / 167.7 ksi
Flexural Strength <sup>4</sup>	ISO 178	80.2 MPa / 11.6 ksi	130 MPa / 20.2 ksi	29 MPa / 4.2 ksi
Flexural Modulus <sup>4</sup>	ISO 178	2861 MPa / 415.0 ksi	4300 MPa / 623.7 ksi	1070 MPa / 155.2 ksi
Flexural Elongation at Break <sup>4</sup>	ISO 178	11.6 %	6.5 %	5.3 %
Impact Strength Charpy (notched)	ISO 179-2	17.0 kJ/m <sup>2</sup>	20.9 kJ/m <sup>2</sup>	2.7 kJ/m <sup>2</sup>
Impact Strength Charpy (unnotched)	ISO 179-2	41.8 kJ/m <sup>2</sup>	48.8 kJ/m <sup>2</sup>	3.1 kJ/m <sup>2</sup>
Impact Strength Izod (notched)	ISO 180	20.9 kJ/m <sup>2</sup>	19.0 kJ/m <sup>2</sup>	2.7 kJ/m <sup>2</sup>
Impact Strength Izod (unnotched)	ISO 180	36.9 kJ/m <sup>2</sup>	41.4 kJ/m <sup>2</sup>	3.8 kJ/m <sup>2</sup>

<sup>1</sup>Conditioning of the specimens: conditioned (70 °C, 62% RH, 336h)

<sup>2</sup>testing speed: 5 mm/min

<sup>3</sup>testing speed: 1 mm/min

<sup>4</sup>testing speed: 2 mm/min