

# Technical Data Sheet

# Ultrafuse® ABS Fusion<sup>+</sup>

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Version No.: 3.1

## General information

### Components

Acetonitrile Butadiene Styrene based filament for Fused Filament Fabrication.

### Product Description

Ultrafuse® ABS Fusion<sup>+</sup> made with Polyscope XILOY™ 3D is an engineering filament which has been optimized for 3D-printing. This special grade has been developed in collaboration with Polyscope Polymers - renowned for its material solutions in the automotive industry. ABS is a thermoplastic which is used in many applications. Although ABS has been classified as a standard material in 3D-printing it is known to be quite challenging to process. Ultrafuse® ABS Fusion<sup>+</sup> combines the properties of ABS with an improved processability. The filament is based on an ABS grade which can be directly printed on glass without any adhesives or tape and has a higher success rate of prints due to extreme low warping.

### Delivery form and warehousing

Ultrafuse® ABS Fusion<sup>+</sup> 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.

### Notice

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	±0.1 mm
Roundness	±0.050 mm	±0.05 mm
Available Spool size	750 g; 2.5 kg; 4 kg	750 g; 2.5 kg; 4 kg
Available colors	Natural, grey and black	

Spool Properties			
Available Spool size	750 g	2.5 kg	4 kg
Outer diameter	200 mm	300 mm	350 mm
Inner diameter	50.5 mm	51.5 mm	51.7 mm
width	55 mm	103 mm	103 mm

Recommended 3D-Print processing parameters		Used for test specimens
Printer	FFF printer	Ultimaker S5
Nozzle Temperature	260 – 280 °C / 500 – 536 °F	280 °C / 536 °F
Build Chamber Temperature	-	-
Bed Temperature	100 – 120 °C / 212 – 248 °F	100 °C / 212 °F
Bed Material	Glass*	Glass + spray glue (e.g. 3D Lac)
Nozzle Diameter	≥ 0.4 mm	0.4 mm
Print Speed	40 - 80 mm/s	40 mm/s

\*Use a small amount of adhesive spray to protect the glass bed

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

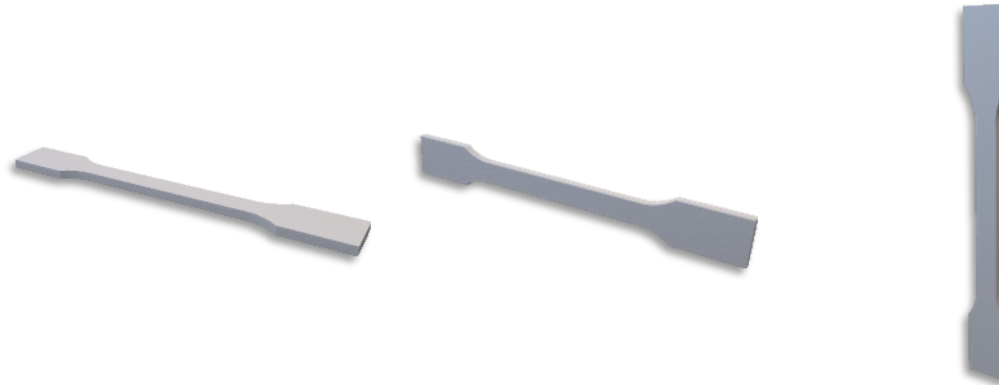
Further Recommendations	
Drying recommendations to ensure printability and best mechanical properties	60 °C in a hot air dryer or vacuum oven for at least 8 to 10 hours. Please note: To ensure constant material properties the material should always be kept dry.
Support material compatibility	Single material breakaway, Ultrafuse® BVOH, Ultrafuse® HIPS

General Properties		Standard
Filament Density*	1084 kg/m <sup>3</sup> / 67.7 lb/ft <sup>3</sup>	ISO 1183-1
Shore Hardness D, 15s	67	ISO 7619-1

\*measured on filament

Thermal Properties		Standard
HDT at 1.8 MPa	75 °C / 167 °F	ISO 75-2
HDT at 0.45 MPa	96 °C / 205 °F	ISO 75-2
Vicat softening point @ 50 N	103 °C / 217 °F	ISO 306
Vicat softening point @ 10 N	78 °C / 172 °F	ISO 306
Glass Transition Temperature	109 °C / 228 °F	ISO 11357-2
Melt Volume Rate	4.7 cm <sup>3</sup> /10 min / 0.29 in <sup>3</sup> /10 min (250 °C, 5 kg)	ISO 1133

## Mechanical Properties<sup>1</sup>



Print direction	Standard	XY Flat	XZ On its edge	ZX Upright
Tensile strength <sup>2</sup>	ISO 527	28.3 MPa / 4.1 ksi	-	20.7 MPa / 3.0 ksi
Elongation at Break <sup>2</sup>	ISO 527	7.0 %	-	1.8 %
Young's Modulus <sup>3</sup>	ISO 527	1445 MPa / 209.6 ksi	-	1349 MPa / 195.7 ksi
Flexural Strength <sup>4</sup>	ISO 178	46.6 MPa / 6.8 ksi	48.7 MPa / 7.1 ksi	26.5 MPa / 3.8 ksi
Flexural Modulus <sup>4</sup>	ISO 178	1390 MPa / 201.6 ksi	1290 MPa / 187.1 ksi	1170 MPa / 169.7 ksi
Flexural Elongation at Break <sup>4</sup>	ISO 178	5.3 %	5.4 %	2.3 %
Impact Strength Charpy (notched)	ISO 179-2	38.6 kJ/m <sup>2</sup>	49.2 kJ/m <sup>2</sup>	3.0 kJ/m <sup>2</sup>
Impact Strength Charpy (unnotched)	ISO 179-2	148.1 kJ/m <sup>2</sup>	173.7 kJ/m <sup>2</sup>	8.6 kJ/m <sup>2</sup>
Impact Strength Izod (notched)	ISO 180	36.9 kJ/m <sup>2</sup>	41.8 kJ/m <sup>2</sup>	3.1 kJ/m <sup>2</sup>
Impact Strength Izod (unnotched)	ISO 180	128.3 kJ/m <sup>2</sup>	127.0 kJ/m <sup>2</sup>	8.3 kJ/m <sup>2</sup>

<sup>1</sup>Conditioning of the specimens: Standard climate (23°C, 50% RH 72h)

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

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

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