General information

Components
Acetonitrile Butadiene Styrene based filament for Fused Filament Fabrication.

Product Description
ABS Fusion⁺ 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. ABS Fusion⁺ 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⁺ 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.
Technical Data Sheet for Ultrafuse ABS Fusion+

Version No. 2.3

Recommended 3D-Print processing parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle Temperature</td>
<td>240 – 260 °C / 464 – 500 °F</td>
</tr>
<tr>
<td>Build Chamber Temperature</td>
<td>-</td>
</tr>
<tr>
<td>Bed Temperature</td>
<td>100 – 120 °C / 212 – 248 °F</td>
</tr>
<tr>
<td>Bed Material</td>
<td>Glass*</td>
</tr>
<tr>
<td>Nozzle Diameter</td>
<td>≥ 0.4 mm</td>
</tr>
<tr>
<td>Print Speed</td>
<td>40 - 80 mm/s</td>
</tr>
</tbody>
</table>

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

Drying Recommendations

Drying recommendations to ensure printability: 60 °C in a hot air dryer or vacuum oven for 4 to 16 hours

Please note: To ensure constant material properties the material should always be kept dry.

General Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printed Part Density</td>
<td>1075 kg/m³ / 67.1 lb/ft³</td>
<td>ISO 1183-1</td>
</tr>
</tbody>
</table>

Thermal Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDT at 1.8 MPa</td>
<td>71 °C / 160 °F</td>
<td>ISO 75-2</td>
</tr>
<tr>
<td>HDT at 0.45 MPa</td>
<td>91 °C / 196 °F</td>
<td>ISO 75-2</td>
</tr>
<tr>
<td>Glass Transition Temperature</td>
<td>114 °C / 237 °F</td>
<td>ISO 11357-2</td>
</tr>
<tr>
<td>Melt Volume Rate</td>
<td>10.0 cm³/10 min / 0.61 in³/10 min (250 °C, 5 kg)</td>
<td>ISO 1133</td>
</tr>
</tbody>
</table>
## Mechanical Properties

<table>
<thead>
<tr>
<th>Print direction</th>
<th>Standard</th>
<th>XY</th>
<th>XZ</th>
<th>ZX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print direction</td>
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<td>ZX</td>
</tr>
</tbody>
</table>

- **Tensile strength**
  - ISO 527
  - Flat: 29.5 MPa / 4.3 ksi
  - On its edge: -
  - Upright: 17.9 MPa / 2.6 ksi

- **Elongation at Break**
  - ISO 527
  - Flat: 10.9 %
  - On its edge: -
  - Upright: 2.1 %

- **Young's Modulus**
  - ISO 527
  - Flat: 1379 MPa / 200 ksi
  - On its edge: -
  - Upright: 1106 MPa / 160 ksi

- **Flexural Strength**
  - ISO 178
  - Flat: 48.3 MPa / 7.0 ksi
  - On its edge: 48.7 MPa / 7.1 ksi
  - Upright: 23.1 MPa / 3.4 ksi

- **Flexural Modulus**
  - ISO 178
  - Flat: 1406 MPa / 204 ksi
  - On its edge: 1133 MPa / 164 ksi
  - Upright: 878 MPa / 127 ksi

- **Flexural Strain at Break**
  - ISO 178
  - Flat: 5.6 %
  - On its edge: 5.9 %
  - Upright: 2.7 %

- **Impact Strength Charpy (notched)**
  - ISO 179-2
  - Flat: 32.0 kJ/m²
  - On its edge: 41.9 kJ/m²
  - Upright: 2.5 kJ/m²

- **Impact Strength Charpy (unnotched)**
  - ISO 179-2
  - Flat: 71.9 kJ/m²
  - On its edge: 118.7 kJ/m²
  - Upright: 6.9 kJ/m²

- **Impact Strength Izod (notched)**
  - ISO 180
  - Flat: 26.4 kJ/m²
  - On its edge: 38.4 kJ/m²
  - Upright: 2.2 kJ/m²

- **Impact Strength Izod (unnotched)**
  - ISO 180
  - Flat: 73.1 kJ/m²
  - On its edge: 131.1 kJ/m²
  - Upright: 6.6 kJ/m²