

## PEI Filament Ultem 9085

Polyether Imide (PEI) Ultem 9085 is a flame-retardant high-performance thermoplastic with a glass transition temperature (T<sub>g</sub>) of 186 °C. This inherently flame retardant plastic has UL94 VO and 5VA ratings. 3D4MAKERS has selected Ultem 9085 for their filament.

The 3D4MAKERS PEI Filament has unique properties because it does not come into contact with water during the production process and is directly packaged in a vacuum packaging. These properties make the 3D4MAKERS PEI Filament particularly suitable for usage in FDM and FFF 3D printers. The material has an excellent adhesion between layers which results in great improvement of the impact resistance, strength, durability and the printing process.

PHYSICAL	CONDITIONS	TEST METHOD	TYPICAL VALUE
Density		ISO 1183	1.34 g/cm <sup>3</sup>
Melt Flow Rate (MVR)	295 °C	ASTM D1238	8.9 g/10 min
Water Absorption	Saturation, 23 °C	ISO 62	0.39 %
Moisture Absorption	23 °C/ 50% RH	ISO 62	0.17 %
Melt Volume Rate	360 °C/5.0 kg	ISO 1182	65 cm <sup>3</sup> /10 min
<b>MECHANICAL</b>			
Tensile modulus	5mm/min	ASTM D738	3440 MPa
Tensile Stress			
Yield	5mm/min	ASTM D738	84 MPa
Break	5mm/min	ASTM D738	74 MPa
Tensile Strain			
Yield	5mm/min	ASTM D738	7 %
Break	5mm/min	ASTM D738	72 %
Flexural Modulus	1.3 mm/min, 50 mm span	ASTM D790	2920 MPa
Flexural Stress, yield	1.3 mm/min, 50 mm span	ASTM D790	138 MPa
<b>IMPACT</b>			
Notched Izod Impact Strength	23°C	ASTM D256	115 J/m
Nocthed Izod Impact Strength	80*10*4, 23 °C	ISO 180/1A	13 kJ/m <sup>2</sup>
Notched Charpy Impact	23 °C	ISO 179/2C	11 kJ/m <sup>2</sup>
<b>THERMAL</b>			
Heat Deflection Temperature	1.8 MPa, Unannealed, 3.2 mm Span	ASTM D648	153 °C
	1.8 Mpa, Flatw 80*10*4 sp=64mm	ISO 75/Af	152 °C
CTE	- 30°C to 80°C, flow	ASTM E831	6.E-05 1/°C

	- 30°C to 80°C, xflow	ASTM E831	6.E-05 1/°C
Vicat Softening Temp	Rate B/120	ISO 306	173 °C
<b>FLAME CHARACTERISTICS</b>			
FAA Flammability	FAR 25.853	FAR 25.853	<5
OSU total heat release	2 minute test	FAR 25.853	16 kW-min/m <sup>2</sup>
OSU Peak Heat Release Rate	5 minute test	FAR 25.853	36 kW/m <sup>2</sup>
Vertical Burn a passes at	60s	FAR 25.853	2 sec
Oxygen Index (LOI)		ASTM D2863	49 %

<b>PRINT RECOMMENDATIONS</b>			
Nozzle Temperature	350 – 380 °C		
Bed Temperature	120 - 160 °C		
Print Speed	20-35 mm/s		
Bed Adhesion	PEI Sheet		

**To get the best results while printing we advise you to keep the 3D printer in a room where there is hardly any draft and/or temperature fluctuations. Keep the 3D printer out of the sun. This cannot be a room where people sleep. When the 3D printer is not being used it is important to keep the 3D4MAKERS PEI Filament in a bag and stored in a cool, dry and dark place until it is used again.**

Disclaimer: 3D4Makers makes no warranties what so ever, expressed or implied, including but not limited to, any implied fitness for any particular purpose. From the moment the product is shipped it is beyond our control. The information in this document is believed to be correct at the time of writing. However, handling, processing, settings, the type of 3D printer, slicing and other variables are completely up to the user. The method through which the product is used can be varied. It is up for the customer to determine how it is 3D printed and whether it is fit for purpose or suited to a particular application.