

## PPSU Filament

Polyphenylsulfone (PPSU) is an amorphous high performance thermoplastic offering better impact resistance and chemical resistance than PEI. PPSU can operate in temperatures up to 180C . PPSU has superior hydrolysis resistance when compared to other amorphous thermoplastics as measured by steam autoclaving cycles, it has virtually unlimited steam sterilizability. It also resists common acids and bases over a broad temperature range. Applications are; Aerospace, Aircraft, Automotive, Dental, Medical, Surgical instruments. The PPSU filament is based on the technology of Solvay.

The 3D4MAKERS PPSU 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 PPSU 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                      |                              | ASTM D792   | 1.29 g/cm <sup>3</sup> |
| Melt volume-Flow Rate (MVR)  | 365 °C/5.0 kg                | ASTM D1238  | 14 to 20 g/10 min      |
| Molding Shrinkage-Flow       | 3,18                         | ASTM D955   | 0.70 %                 |
| Water Absorption             | 24 h                         | ASTM D570   | 0.37 %                 |
| <b>MECHANICAL</b>            |                              |             |                        |
| Tensile modulus              | 3.18 mm                      | ASTM D638   | 2340 MPa               |
| Tensile Strength             | 3.18 mm                      | ASTM D638   | 69.6 MPa               |
| Tensile Elongation           |                              | ASTM D638   |                        |
| Yield                        | 3.18 mm                      |             | 7.2%                   |
| Break                        | 3.18 mm                      |             | 60 to 120%             |
| Flexural Modulus             | 3.18 mm                      | ASTM D790   | 2410 MPa               |
| Flexural Strength            | 5.0 % Strain, 3.18 mm        | ASTM D790   | 91.0 MPa               |
| <b>IMPACT</b>                |                              |             |                        |
| Notched Izod Impact          | 3.18 mm                      | ASTM D256   | 690 J/m                |
| Tensile Impact Strength      | 3.18 mm                      | ASTM D1822  | 399 kJ/m <sup>2</sup>  |
| <b>THERMAL</b>               |                              |             |                        |
| Heat Deflection Temperature  | 1.8 MPa, Unannealed, 3.18 mm | ASTM D648   | 207 °C                 |
| Glass Transition Temperature |                              | ASTM E1356  | 220 °C                 |
| <b>ELECTRICAL</b>            |                              |             |                        |
| Volume Resistivity           |                              | ASTM D257   | 9.0 E+ 15 ohms•cm      |
| Dielectric Strength          |                              | ASTM D149   |                        |
|                              | 0.0254 mm                    |             | > 200 kV/mm            |

|                                    |                |           |               |
|------------------------------------|----------------|-----------|---------------|
|                                    | 3.19 mm        |           | 15 kV/mm      |
| Dielectric Constant                | 3.18 mm, 60 Hz | ASTM D150 | 3.44          |
| <b>FLAMMABILITY</b>                |                |           |               |
| Flame Rating                       | 0.76 mm        | UL 94     | V-0           |
| <b>OPTICAL</b>                     |                |           |               |
| Refractive index                   |                | ASTM D542 | 1.672         |
| <b>ADDITIONAL INFORMATION</b>      |                |           |               |
| Steam Sterilization -w/ Morpholine |                |           | > 1000 Cycles |

|                              |              |  |  |
|------------------------------|--------------|--|--|
| <b>PRINT RECOMMENDATIONS</b> |              |  |  |
| Nozzle Temperature           | 360 - 400 °C |  |  |
| Bed Temperature              | 140 °C +     |  |  |
| Print Speed                  | 15-30 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 PPSU Filament in a bag and stored in 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.