PLASTICS ENGINEERED BY GEHR

# FIL-A-GEHR®

## Filaments for professional 3D printing

## PPSU

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**FIL-A-GEHR® PPSU** is an amorphous material, with improved impact and hydrolysis resistance compared to PSU and PEI. The extremely high notch impact strength remains also after a heat aging.

## FEATURES OF FILAMENTS MADE BY GEHR

» Highest precision in diameter and roundness
» Filaments made of high-quality raw materials
» Compatible with all open-system 3D printers
» Low-emission and odour free
» Void-free
» Good layer adhesion
» Ideal flow behaviour while printing
» Carefully spooled and packed in easy to use aluminium-laminated resealable zip bags

## PRODUCT RANGE

| diameter | 1 kg spool (~2,2 lbs) |
|---|---|
| 1.75 mm 0.07'' | ● ● |

**Colours**: ● natural ● black

## DISTINCTIVE FEATURES FIL-A-GEHR® PPSU

» High strength and rigidity
» Very high toughness (also at low temperatures)
» Very good dimensional stability
» Very high chemical resistance
» High operating temperature (approx. +170 °C)
» Very good sterilizability
» Pressure nozzle temperature 390-410°C, printing plate temperature 220°C,
» Printing room temperatur 170-210°C

## TYPICAL APPLICATIONS

» Instruments for microinvasive surgery
» Pump impellers, pump parts
» Sterilization cassettes
» Valves

### GEHR, Specialist In Plastics – Premium Quality Since 1932

We extrude thermoplastic semi-finished materials and rank amongst the global leading producers of technical semi-finished products. FIL-A-GEHR® expands our product range with plastic filaments for 3D printers. GEHR produces the filaments in Mannheim and has been representing innovation and premium quality since 1932.



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# TECHNICAL DATA FIL-A-GEHR® PPSU

| Properties | Parameters | Units | Values |
|---|---|---|---|
| **General Properties** | | | |
| Specific gravity ($\rho$) | ISO 1183 | g/cm³ | 1.31 |
| Water absorption | ISO 62 | % | 0.4 |
| Moisture | ISO 62 | % | 0.1 |
| Maximum permissible service temperature | UL746B | °C | 170 |
| Lower permissible service temperature | UL746B | °C | -50 |
| **Mechanical Properties** | | | |
| Tensile strength at yield ($\sigma_S$) | ISO 527 | MPa | 80 |
| Elongation at yield ($\varepsilon_S$) | ISO 527 | % | 7 |
| Tensile strength at break ($\sigma_R$) | ISO 527 | MPa | - |
| Elongation at break ($\varepsilon_R$) | ISO 527 | % | ≥50 |
| Impact strength ($a_n$) | ISO 179 | kJ/m² | no break |
| Notch impact strength ($a_k$) | ISO 179 | kJ/m² | 13 |
| Ball indentation ($H_k$) / Rockwell hardness | ISO 2039-1 | N/mm² | 141 |
| Shore-D | ISO 868 | | 86 |
| Flexural strength ($\sigma_{B\ 3,5\ \%}$) | ISO 178 | MPa | 105 |
| Modulus of elasticity ($E_t$) | ISO 527 | MPa | 2350 |
| **Thermal Properties** | | | |
| Vicat-softening point (VST/B/50) | ISO 306 | °C | - |
| Heat deflection temperature (HDT/B) | ISO 75 | °C | 214 |
| Coef. of linear thermal expansion ($\alpha$) | ISO 11359 | $K^{-1}*10^{-4}$ | 0.56 |
| Thermal conductivity at 20 °C ($\lambda$) | ISO 22007-4 | W/(m*K) | 0.35 |
| Glass transition temperature ($T_G$) | ISO 3146 | °C | 220 |
| Melting temperature ($T_m$) | ISO 3146 | °C | 220 |
| **Printing Properties** | | | |
| Pressure nozzle temperature | | °C | 370-390 |
| Printing plate temperature | | °C | 150 |
| Build chamber temperature | | °C | 90 |
| Nozzle diameter | (hardend steel) | mm | 0.40 |
| Print speed | | mm/s | 45 |
| Fan speed | (activated on layer 4) | % | 0-25 |
| Predrying temperature | | °C | 120 |
| Predrying time | | h | 8 |

All properties are measured under laboratory conditions using the analytical method shown. The limits in these specifications apply only to data obtained using the specified test methods. Different analysis methods or analysis conditions can lead to different values.



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