Technical Manual

PA6-CF Filaments

PA6-CF is a FFF 3D printing filaments, which is produced with LUVOCOM® 3F PAHT CF 9742 BK as the main raw material. PA6-CF is a polyimide modified material containing 15% carbon fiber. It has the characteristics of high temperature resistance and low shrinkage and is easy to print. It can be used on FFF3D printers in non-heated chambers. It has excellent tensile and impact strength, heat distortion temperature up to 200°C, and can be used for a long time at a temperature of 180°C.

Main features：

High stiffness/high strength/low warpage/high temperature resistance.

The main parameters:

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| --- | --- | --- | --- |
| Physical properties | Testing method | Unit | Typical value |
| Density | ISO 1183 | g/cm3 | 1.24~1.26 |
| Melt index MFR(250℃/2.16Kg) | ISO 1133 | g/10min | 3~6 |
| Water absorption (23℃/24h) | ISO 62 | % | ＜0.3 |
| Mechanical behavior | | | |
| Tensile strength | ISO 527 | Mpa | 60~65 |
| Elongation at break | ISO 527 | % | 6~6.5 |
| Elastic modulus | ISO 527 | Mpa | 4900~5000 |
| Bending strength | ISO178 | Mpa | / |
| Notched impact strength | ISO180 | KJ/m2 | 7.5~8 |
| Thermodynamic properties | | | |
| HDT@ 0.455 MPa(66 psi) | ISO75 | ℃ | 200 |
| Continuous use temperature | IEC 60216 | ℃ | 150 |
| Operating temperature（Longest service life 200 hours） | | ℃ | 180 |
| Electrical characteristics | | | |
| Insulation resistance（strip electrode ） | IEC 60167 | Ω | ≤10² |
| Surface resistance | IEC 60093 | Ω | ≤10² |

Test Spline Printing Conditions：

|  |  |
| --- | --- |
| Test Equipment | Guider IIS （Flashforge technology） |
| Nozzle diameter | 0.6mm |
| Nozzle temperature | 280 °C |
| Printing speed | 50mm/s |
| Wall thickness | 1.8mm |
| Filling | 100% |
| Standard spline | The specific dimensions are as in appendix 1 |

Recommended Printing Parameters:

|  |  |
| --- | --- |
| Parameter |  |
| Nozzle temperature | 270~290℃(Recommended 280℃) |
| Print platform temperature | 60~90℃(Recommend 80℃) |
| Printing platform materials | Tempered glass, BuildTak, carbon fiber board |
| Nozzle diameter | φ0.4/0.6mm(Recommendφ0.6mm) |
| Nozzle and feed gear material | High strength steel |
| Model cooling fan | Closure |
| Layer thickness | 0.12~0.3mm |
| Printing speed | 40~60mm/s(Recommend 50mm/s) |
| Idle speed | 60~120mm/s |
| Printing ambient temperature | Room temperature ~50℃ |
| Withdrawal strength | 4~6mm |
| Withdrawal speed | 40~60mm/s |
| Support materials | PVA,PVOH,BVOH |

Precautions：

To prevent moisture absorption and contamination, the packaging of filaments should be kept airtight and undamaged until they are opened for use. For the same reason, some used filaments should be resealed before storage.

If filaments deteriorate due to moisture absorption, they should be dried before use. It is recommended to dry the filaments in a hot air oven at 80°C for at least 12 hours to ensure the success rate and quality of the printed model.

If using PA6-CF as its own support material, remove the support structure after the model has cooled. After the model absorbs moisture, the support structure may be glued to the model and will be difficult to remove.

After the model is printed, it is recommended to dry it in an oven at 80~100°C for 1~3 hours to increase the strength of the model.

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Annex 1: Test Spline Size and Printing Orientations