Technical Manual

PET-CF Filaments

PET-CF is a FFF 3D printing consumable, which is produced with LUVOCOM® 3F PET CF 9780 BK as the main raw material. PET-CF is a polyester modified material containing 15% carbon fiber, which has the characteristics of temperature resistance and low shrinkage and is easy to print, and can be used on FFF3D printers in non-heated chambers. It has excellent rigidity and tensile strength and can be used for a long time at a temperature of 120°C.

Main Features：

High stiffness/low warpage/temperature resistance

The Main Parameters:

|  |  |  |  |
| --- | --- | --- | --- |
| Physical properties | Testing method | Unit | Typical value |
| Density | ISO 1183 | g/cm3 | 1.4 |
| 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 | 45~50 |
| Elongation at break | ISO 527 | % | 6~7 |
| Elastic modulus | ISO 527 | Mpa | 3600~4000 |
| Bending strength | ISO178 | Mpa | / |
| Notched impact strength | ISO180 | KJ/m2 | 5~6 |
| Thermodynamic properties | | | |
| HDT@ 0.455 MPa(66 psi) | ISO75 | ℃ | 100 |
| Operating temperature（Service life up to 200 hours） | | ℃ | 125 |

Test Spline Printing Conditions：

|  |  |
| --- | --- |
| Test Equipment | Guider IIS （Flashforge technology） |
| Nozzle diameter | 0.6mm |
| Nozzle temperature | 290 °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 parameter | 280~300℃(Recommended 290℃) |
| Print platform temperature | 70~100℃(Recommended 90℃) |
| Printing platform materials | Tempered glass，BuildTak，Carbon fiber board |
| Nozzle diameter | φ0.4/0.6mm(Recommendedφ0.6mm) |
| Nozzle and feed gear material | High strength steel |
| Model cooling fan | Closure |
| Layer thickness | 0.12~0.3mm |
| Printing speed | 40~60mm/s(Recommended 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 PET-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 orientation

