

Technical Data Sheet

Ultrafuse PAHT CF15

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Version No.: 3.5

General information

Components

High temperature Polyamide based filament filled with 15% carbon fibers for Fused Filament Fabrication.

Product Description

PAHT CF15 is a high-performance 3D printing filament that opens new application fields in FFF printing. In parallel to its advanced mechanical properties, dimensional stability, and chemical resistance, it has very good processability. It works in any FFF printer with a hardened nozzle. In addition to that, it is compatible with water-soluble support material and HiPS, which allow printing complex geometries that work in challenging environments. PAHT CF15 has high heat resistance up to 130 °C and low moisture absorption.

Delivery form and warehousing

Ultrafuse PAHT CF15 filament should be stored at 15 - 25°C in its originally sealed package in a clean and dry environment. If the recommended storage conditions are observed the products will have a minimum shelf life of 12 months.

Product safety

Recommended: Process materials in a well ventilated room, or use professional extraction systems. For further and more detailed information please consult the corresponding material safety data sheets.

Notice

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

Recommended 3D-Print processing parameters

| | |
|---------------------------|-----------------------------|
| Nozzle Temperature | 260 – 280 °C / 500 – 536 °F |
| Build Chamber Temperature | - |
| Bed Temperature | 100 – 120 °C / 212 – 248 °F |
| Bed Material | PEI or Glass |
| Nozzle Diameter | ≥ 0.6 mm, Ruby or Hardened |
| Print Speed | 30 - 80 mm/s |

Drying Recommendations

| | |
|---|--|
| Drying recommendations to ensure printability | 70 °C in a hot air dryer for 4 to 16 hours |
| Optimum drying recommendations for best mechanical part properties | 80 °C in a vacuum oven for at least 40 hours |
| Please note: To ensure constant material properties the material should always be kept dry. | |

General Properties

| | | Standard |
|------------------------------------|--|------------|
| Printed Part Density (dry) | 1232 kg/m ³ / 76.9 lb/ft ³ | ISO 1183-1 |
| Printed Part Density (conditioned) | 1234 kg/m ³ / 77.0 lb/ft ³ | ISO 1183-1 |

Thermal Properties

| | | Standard |
|-------------------------------|--|-------------|
| HDT at 1.8 MPa (dry) | 92 °C / 198 °F | ISO 75-2 |
| HDT at 0.45 MPa (dry) | 145 °C / 293 °F | ISO 75-2 |
| HDT at 1.8 MPa (conditioned) | 91 °C / 196 °F | ISO 75-2 |
| HDT at 0.45 MPa (conditioned) | 128 °C / 262 °F | ISO 75-2 |
| Glass Transition Temperature | 70 °C / 158 °F | ISO 11357-2 |
| Crystallization Temperature | 180 °C / 356 °F | ISO 11357-3 |
| Melting Temperature | 234 °C / 453 °F | ISO 11357-3 |
| Melt Volume Flow Rate | 42.2 cm ³ /10min / 2.6 in ³ /10min (275°C/5kg) | ISO 1133 |

Mechanical Properties | Dried Specimen



| Print direction | Standard | XY | XZ | ZX |
|------------------------------------|-----------|------------------------------|------------------------|-------------------------------|
| Tensile strength | ISO 527 | Flat 103.2 MPa / 15.0 ksi | On its edge - | Upright 18.2 MPa / 2.6 ksi |
| Elongation at Break | ISO 527 | 1.8 % | - | 0.5 % |
| Young's Modulus | ISO 527 | 8386 MPa / 1216 ksi | - | 3532 MPa / 512 ksi |
| Flexural Strength | ISO 178 | 160.7 MPa / 23.3 ksi | 171.8 MPa / 24.9 ksi | 50.8 MPa / 7.4 ksi |
| Flexural Modulus | ISO 178 | 8258 MPa / 1198 ksi | 7669 MPa / 1112 ksi | 2715 MPa / 394 ksi |
| Flexural Strain at Break | ISO 178 | 2.4 % | 2.8 % | 1.8 % |
| Impact Strength Charpy (notched) | ISO 179-2 | 4.8 kJ/m ² | 3.9 kJ/m ² | 1.3 kJ/m ² |
| Impact Strength Charpy (unnotched) | ISO 179-2 | 20.6 kJ/m ² | 19.3 kJ/m ² | 2.9 kJ/m ² |
| Impact Strength Izod (notched) | ISO 180 | 4.9 kJ/m ² | 5.1 kJ/m ² | - |
| Impact Strength Izod (unnotched) | ISO 180 | 16.4 kJ/m ² | 18.1 kJ/m ² | 2.9 kJ/m ² |

Electrical Properties

| | | | | |
|---------------------|---------------|-------------|---|-------------|
| Volume resistivity | IEC 62631-3-1 | 3.2E+07 Ωcm | - | 1.6E+05 Ωcm |
| Surface resistivity | IEC 62631-3-2 | 9.7E+05 Ω | - | 1.8E+06 Ω |

Mechanical Properties | Conditioned Specimen



| Print direction | Standard | XY | XZ | ZX |
|------------------------------------|-----------|----------------------------|------------------------|-------------------------------|
| Tensile strength | ISO 527 | Flat 62.9 MPa / 9.1 ksi | On its edge - | Upright 19.1 MPa / 2.8 ksi |
| Elongation at Break | ISO 527 | 2.9 % | - | 0.8 % |
| Young's Modulus | ISO 527 | 5052 MPa / 733 ksi | - | 2455 MPa / 356 ksi |
| Flexural Strength | ISO 178 | 125.1 MPa / 18.1 ksi | 121.9 MPa / 17.7 ksi | 56.0 MPa / 8.1 ksi |
| Flexural Modulus | ISO 178 | 6063 MPa / 879 ksi | 6260 MPa / 908 ksi | 2190 MPa / 318 ksi |
| Flexural Strain at Break | ISO 178 | No break | 3.6 % | 4.0 % |
| Impact Strength Charpy (notched) | ISO 179-2 | 5.1 kJ/m ² | 5.3 kJ/m ² | 1.6 kJ/m ² |
| Impact Strength Charpy (unnotched) | ISO 179-2 | 21.9 kJ/m ² | 20.4 kJ/m ² | 2.8 kJ/m ² |
| Impact Strength Izod (notched) | ISO 180 | 6.5 kJ/m ² | 5.8 kJ/m ² | - |
| Impact Strength Izod (unnotched) | ISO 180 | 16.3 kJ/m ² | 15.1 kJ/m ² | 4.1 kJ/m ² |