

TECHNICAL DATA SHEET

PAHT-GF

High temperature Polyamide based with 15% chopped glass fiber reinforced FDM material.

BRIEF INTRODUCTION

PAHT-GF is specially developed for FDM 3D printing process, and its substrate material is high temperature nylon, which has low density, low moisture absorption, high strength, high abrasion resistance, excellent chemical resistance and high heat resistance. It also has good dimensional stability, no warpage and no shrinkage during the printing process, and can be used with S-PAHT Quick-Remove Support material to solve the problem of poor molding effect on the support surface of complex models.

CHARACTERISTIC

Smart Fiber Reinforced Technology

controlling the dispersion and distribution of chopped carbon fibers within the material matrix during the extrusion process, the fibers form a mesh skeleton structure within the material and bear most of the load transferred by the material matrix. Smart Fiber Reinforced Technology greatly improves the mechanical properties and heat resistance of the material, and releases the internal stress during the printing process through the fiber mesh structure, resulting in good dimensional stability of the printed part and no warpage.

Low Moisture Sensitivity

PAHT-GF based on modified high temperature nylon, whose saturated moisture absorption rate is only one tenth of ordinary PA6, completely solving the defects of the mechanical properties and dimensional stability of nylon materials that change greatly after absorbed moisture.

Super Abrasive Resistance

PAHT-GF has a low coefficient of friction, self-lubricating properties and excellent wear resistance, which can easily meet all kinds of high-strength gears or industrial applications with high wear requirements.

IDENTIFICATION OF THE MATERIAL

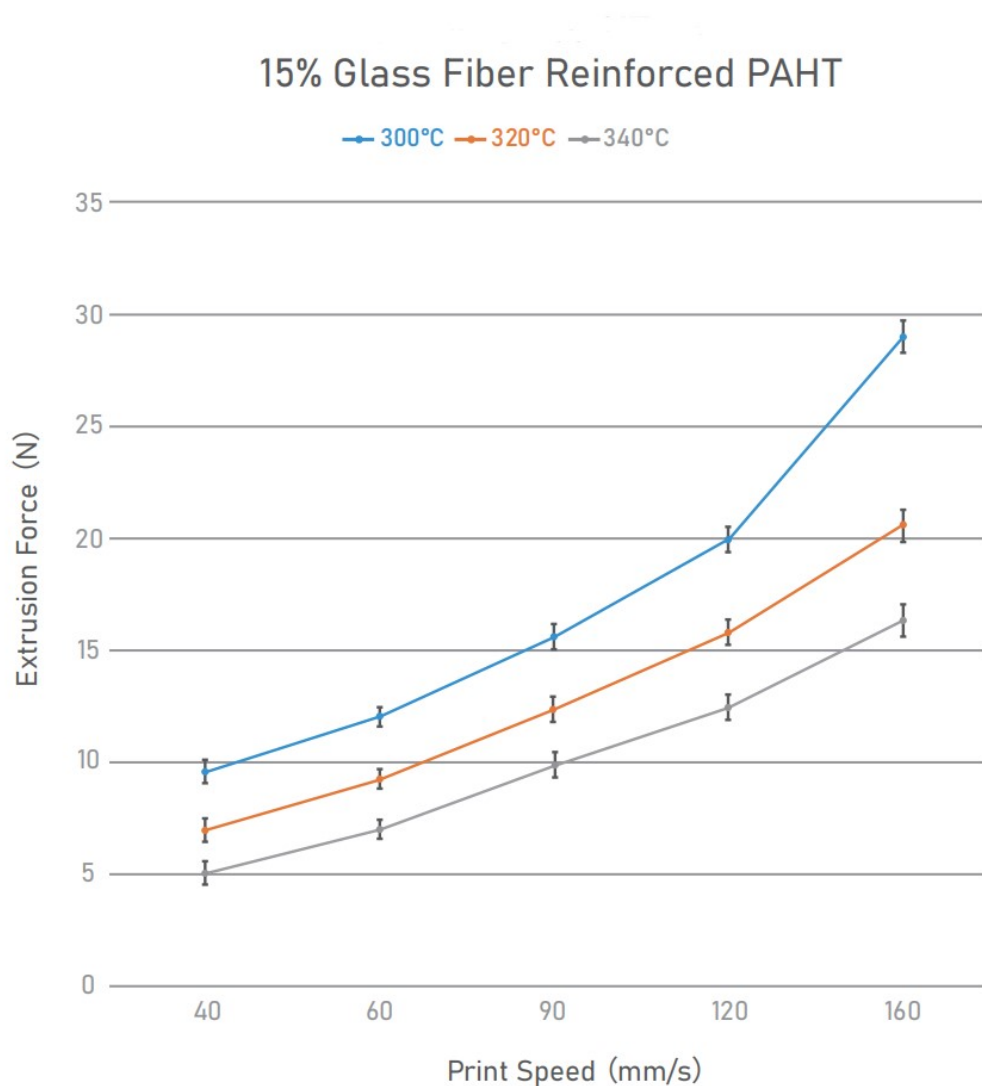
Trade name	PAHT-GF
Application	3D PRINTING
GUIDELINE FOR PRINT SETTINGS	
Nozzle temperature	300-320°C
Bed temperature	70~90°C
Bed material	PEI or Coating with PVP glue
Active cooling fan	OFF
Recommend nozzle size	0.4mm-1.0mm
Raft distance	0.12-0.16mm
Print speed	30-90mm/s
Retraction distance	1-3 mm
Retraction speed	1800-3600 mm/min
Recommended support material	S-PAHT Quick-Remove Support

Settings are based on a 0.6mm nozzle. Nozzle temp.:320°C, Bed temp.:80°C, Printing speed:45mm/s, filling rate:100%, filling angle:±45° Annealing conditions:100°C 8hrs.

MATERIAL PROPERTIES	Test Method	Typical value
Density	ISO 1183	1.20 g/cm ³
Water absorption	ISO 62: Method 1	0.6%
Melting Temperature	ISO 11357	237°C
Melt index	300°C, 2.16kg	4.2
Determination of temperature	ISO 75: Method A	111.5°C (1.80MPa)

	ISO 75: Method B	170.8°C (0.45MPa)
Tensile strength(X-Y)		86.83±3.03 MPa
Young's modulus(X-Y)	ISO 527	5551.26±416.57 MPa
Elongation at break (X-Y)		2.05±0.15 %
Bending strength (X-Y)		136.19±7.77 MPa
Bending modulus (X-Y)	ISO 178	4419.15±138.02 MPa
Charpy impact strength (X-Y)	ISO 179	5.91±0.42 KJ/m ²
Tensile strength (Z)		48.75±1.95 MPa
Young's modulus (Z)	ISO 527	4033.73±95.15 MPa
Elongation at break (Z)		1.45±0.08 %

Extrusion Force vs Print Speed Test



Test parameters: 12mm length brass heat block, BMG extruder, Phaetus Hardened Steel Nozzle, Nozzle size 0.4mm, Layer Height 0.2mm.

Other suggestions:

1. Nylon material is very easy to absorb moisture within the environment, and printing after absorbing moisture will result ozzing, extruding with bubbles and rough surface appearance, thus reducing print quality. It is recommended that put the filament into a dry box (humidity below 15%) immediately after opening the PAHT-GF bag for printing.

2. After the material is damp, there will be more printing ozzing, bubbles extruded and rough printing surface. Please dry the filament in an oven at 80-100°C for 4-6h to restore the printing quality of PAHT-GF.

3. It is recommended to use hardened steel and above grade nozzles, which can effectively improve the print quality. Besides, it is recommended that the thickness of the heating block is longer 12mm.

4. After the printing is completed, the PAHT-GF printed part can be annealed to further improve the strength of print part. Annealing conditions: leave printing part in an oven at 80-100°C for 4 to 8 hours and cool to room temperature naturally.

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