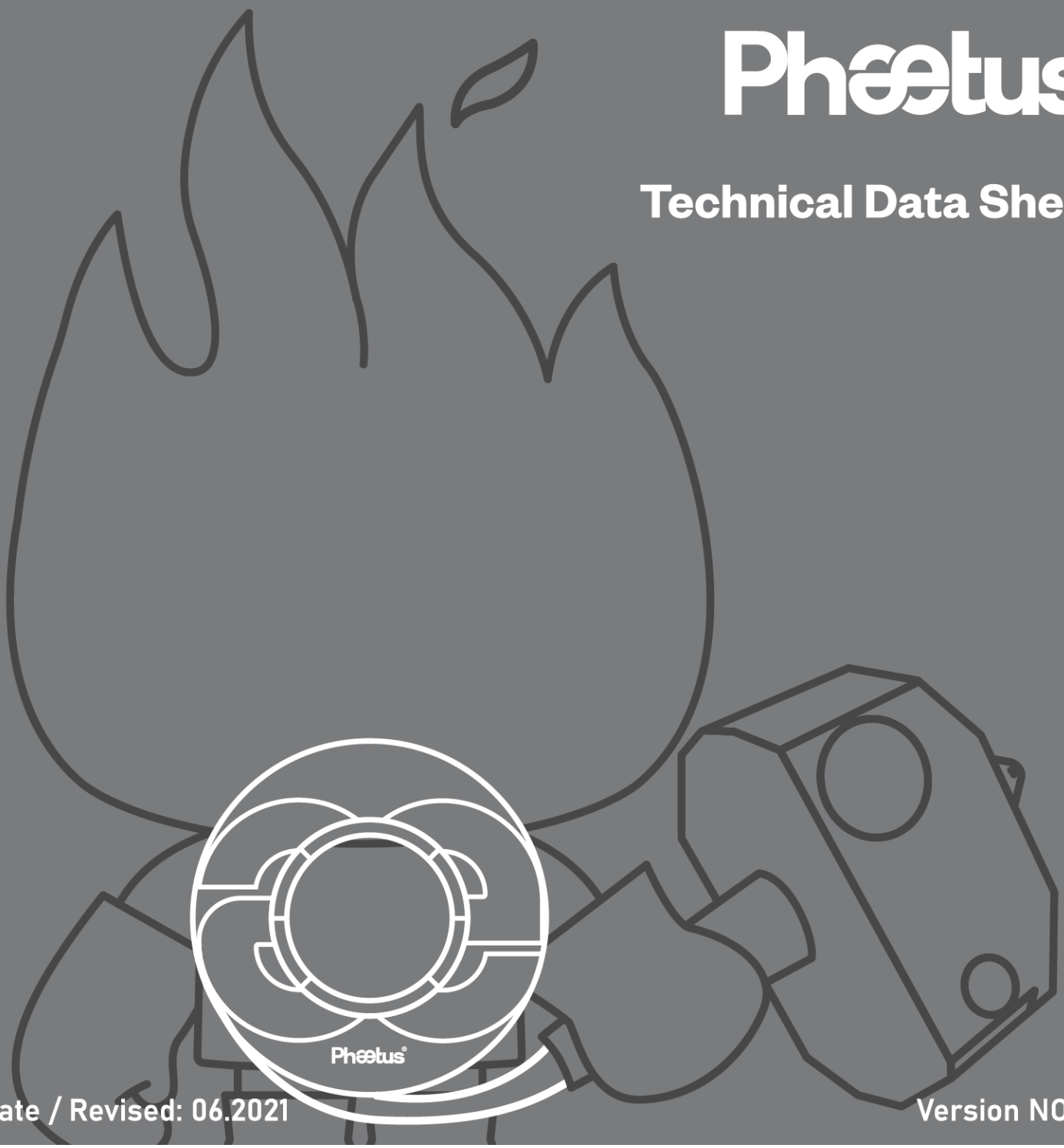
Phœtus®

Technical Data Sheet



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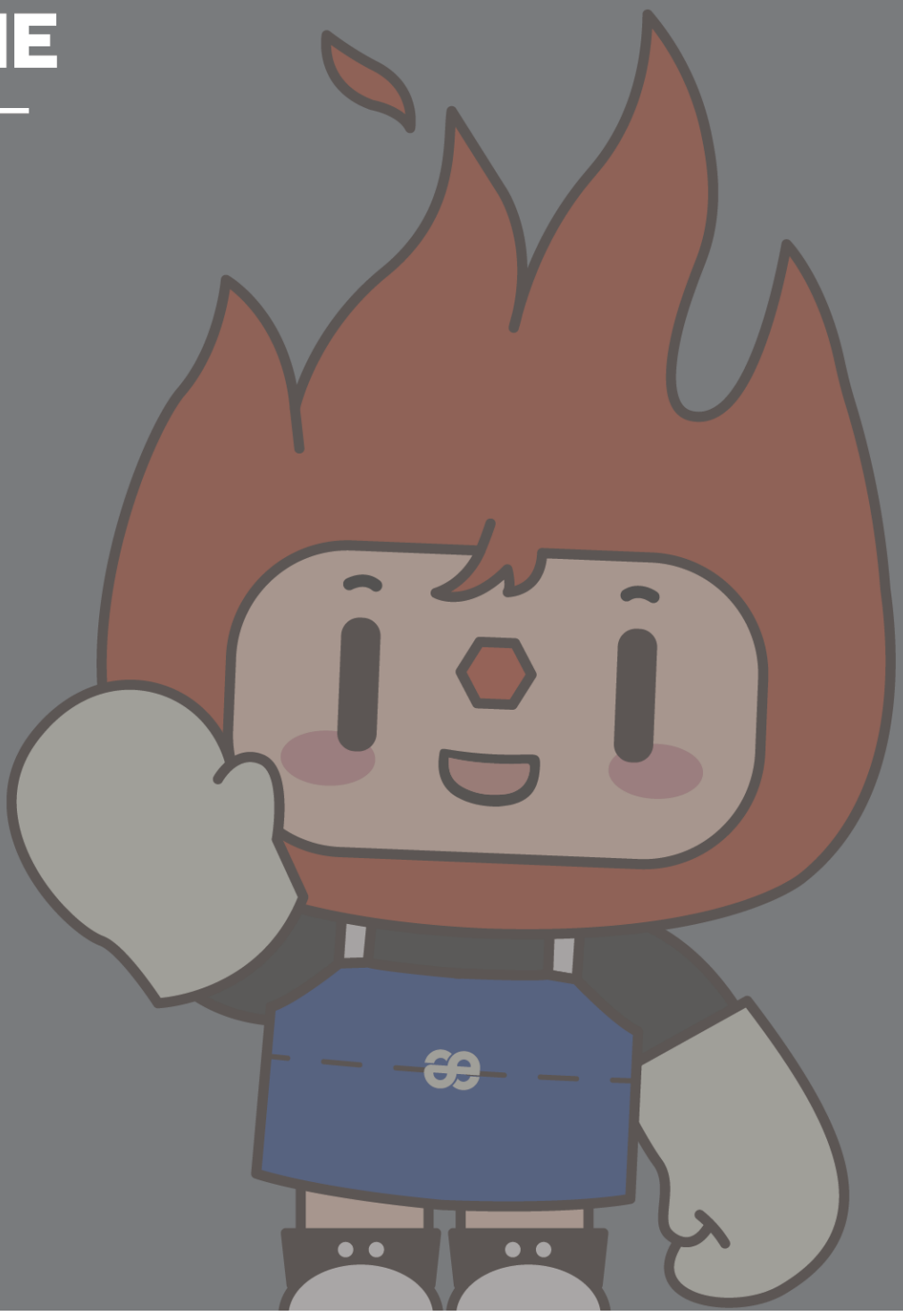
Supreme Pursuit.



www.phaetus.com

Company Introduction

About us

Phaetus is dedicated to the design of the nozzle system for high-end 3D printers and the research and development of materials and printing processes. We also provides customers with software and hardware integrated system solutions for materials, printing heads and printing processes based on applications.

Through continuous product innovation, we try to solve customers' pain points, and for global 3D printer users, provide high-end product designs and solutions is the direction and goal of our efforts.

Focusing on the market of core parts of middle and high-end 3D printing equipment, we insist that R&D and innovation of products and technologies are the core driving forces on the road of development. To this end, Phaetus has built a strong R&D and marketing team, developed a number of global best-selling products, obtained dozens of patents, established sales channels in more than 100 countries and regions around the world, and has high visibility and influence among 3D printing enthusiasts and communities.

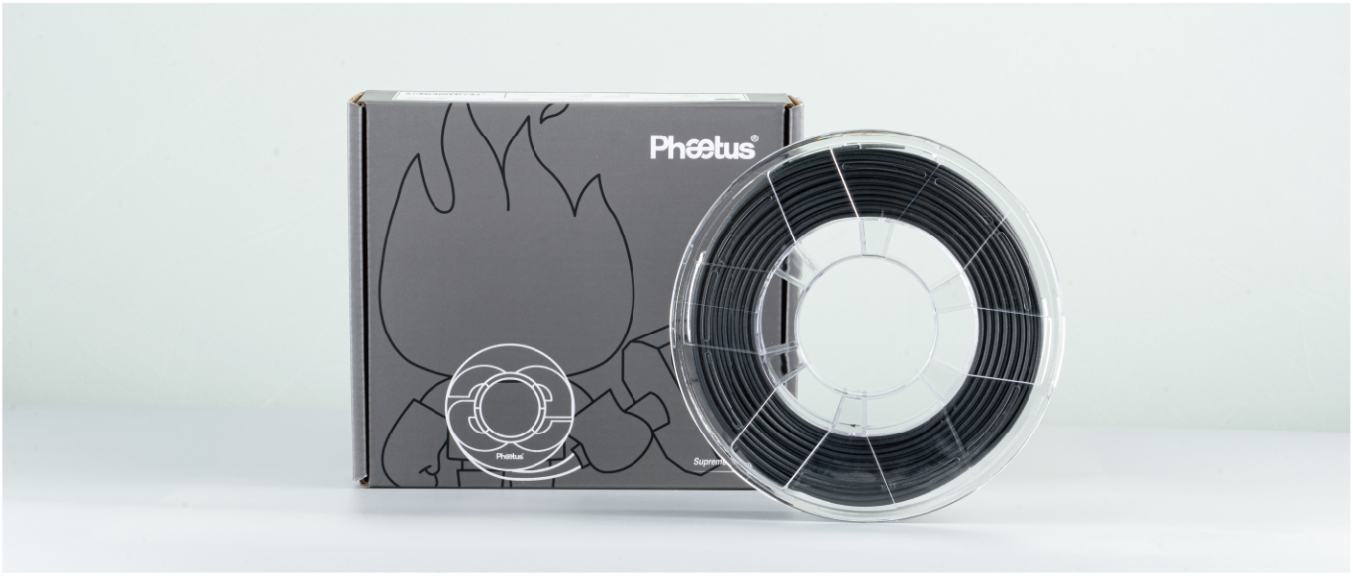
Deep research in the 3D printing industry, become a leader in the 3D printing subdivision field! In the future, we will continue to work hard and innovate constantly!

Contact us

For any inquiries or technical support, please contact: **support@phaetus.com**

aeCarbon™ UltraPA-CF

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



Product Description

aeCarbon™ UltraPA-CF 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 aeSupport™ S-Purple Quick-Remove Support material to solve the problem of poor molding effect on the support surface of complex models.

Product Advantages

• Smart Fiber Reinforced Technology
Phaetus 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
aeCarbon™ UltraPA-CF 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
aeCarbon™ UltraPA-CF 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.

Available

Colors	Black
Diameter	1.75mm/2.85mm
Net weight	250g/500g/1kg

Material Properties

Property	Testing method	Typical value
Density	ISO 1183	1.15 g/cm³
Water absorption	ISO 62: Method 1	0.6 %
Melting temperature	ISO 11357	231°C
Melt index	280°C, 2.16kg	10.78
Determination of temperature	ISO 75: Method A	113°C (1.80MPa)
	ISO 75: Method B	188°C (0.45MPa)
Tensile strength(X-Y)	ISO 527	121.77± 4.28 MPa
Young's modulus(X-Y)		7807.99 ± 517.99 MPa
Elongation at break (X-Y)		1.88 ± 0.11 %
Bending strength (X-Y)	ISO 178	190.85 ± 2.07 MPa
Bending modulus (X-Y)		8512.22 ± 241.31 MPa
Charpy impact strength (X-Y)	ISO 179	7.74 ± 1.13 KJ/㎡
Single shell Z-axis tensile strength	Custom method: Vase mode Nozzle size: 0.6mm/Layer height: 0.3mm Layer time: 20s	41.90 ± 3.87 MPa

Specimens printed under the following conditions: Nozzle temp 320°C, bed temp 80°C, print speed 45mm/s, infill 100%, infill angle ±45°
Post-processing: 100°C Annealing 8 hours

Recommended printing conditions

Nozzle temperature	300-320°C
Recommended nozzle diameter	0.4-1.0mm
Recommended build surface treatment	PEI Film or Coating with PVP glue
Build plate temperature	70-80°C
Raft separation distance	0.08-0.12mm
Cooling fan speed	Off
Print speed	30-120 mm/s
Retraction distance	3-6 mm
Retraction speed	1800-3600 mm/min
Recommended support material	aeSupport™ S-Purple Quick Remove Support Material

Additional 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 aeCarbon™ UltraPA-CF vacuum foil bag for printing. Please put the unused filament back into the original aluminum foil bag for sealed storage.

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 aeCarbon™ UltraPA-CF

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

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

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