

Phaetus® FDM Printing Material Technical Data Sheet

aeWorthy™ ASA-Aero

Lightweight ASA 3D Printing Material

发泡型 ASA 3D 打印材料

Production Introduction

产品介绍

aeWorthy™ ASA-Aero is a type of lightweight 3D printing filament, specifically developed for the fields of aircraft models, ship models, drones, etc. ASA-Aero controls the foaming ratio of the material by adjusting the nozzle temperature during the printing process so that the density of the material extruded by the nozzle can be adjusted within a certain range. With this technique, it is easy to reduce the weight of the model. In the best-case scenario, the model weight can be reduced to 50% of a model printed with ordinary ASA. In addition to that, the matte texture of the printed surface can reduce the visibility of printed layers and thus give a smooth surface finish.

aeWorthy™ ASA-Aero 专为航模、船模、无人机等领域研发，提供了一种轻质的 3D 打印耗材。ASA-Aero 通过在打印过程中温度调节，控制材料的发泡倍率，使喷头挤出的耗材密度可以在一定范围内调节，降低模型重量，最佳情况下可降至普通 ASA 打印模型的 40%左右；打印件表面的磨砂质感也可以一定程度上降低层纹现象。

Product Advantage

产品亮点

- On-Demand foaming technology

aeWorthy™ ASA-Aero is a type of ASA filament that will start foaming with the aid of a blowing agent during the printing process. The blowing agent is in an unexcited state in the ASA filament before printing. During the printing process, by adjusting the printing temperature, the foaming ratio of the blowing agent can be easily controlled. The maximum foaming ratio can reach 250%. Meanwhile, ASA-Aero retains the original UV aging resistance and high heat resistance of ASA material, which is suitable for long-term use in high-temperature outdoor environments.

- 在线发泡技术

aeWorthy™ ASA-Aero 是一款在打印过程中进行发泡的 ASA 耗材。在打印前，发泡剂在耗材内处于未激发状态，在打印过程中通过调整打印温度可以自由控制发泡倍率，最大发泡倍率可达 250%。同时 ASA-Aero 保留了 ASA 材料原有的耐紫外老化性能和高耐热性能，适合长期在高温的户外环境中使用。

Product details

产品详情

Color: Natural/ Red/ Yellow/ Grey/ Black

Diameter: 1.75mm

Net Wet: 1 KG

Material Properties

物性表

| 测试项目 Test Item | 测试方法 Test Method | 典型值 Typical Value |
|---|--------------------------------------|-----------------------------------|
| 密度 Density | ISO 845 | 1.03 g/cm ³ |
| 熔融指数 Melt index | ISO 1133 250°C, 2.16kg | 1.5 g/10min |
| 热变形温度 Determination of temperature | ISO 75: Method A ISO 75: Method B | 55°C (1.8 MPa) 70°C (0.45 MPa) |
| 断裂拉伸强度 (X-Y) Tensile strength at Break (X-Y) | ISO 527 | 8.25±0.15 MPa |
| 断裂伸长率 (X-Y) Elongation at break (X-Y) | | 11.52±0.58 % |
| 杨氏模量 (X-Y) Young's Modulus | | 593.99±24.34 MPa |
| 断裂拉伸强度 (Z) Tensile strength at Break (Z) | ISO 527 | 7.86±0.14 MPa |
| 断裂伸长率 (Z) Elongation at break (Z) | | 5.54±0.28 % |
| 杨氏模量 (X-Y) Young's Modulus | | 457.94±20.84 MPa |

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|--|---------|-----------------------------|
| 弯曲强度 (X-Y) Bending strength | ISO 178 | 14.31±1.66 MPa |
| 弯曲模量 (X-Y) Bending Modulus | | 544.92±74.44 MPa |
| 缺口冲击强度 (X-Y) Charpy impact strength | ISO 179 | 2.29±0.13 KJ/m ² |

Specimens printed under the following conditions: Flow rate 50%, Nozzle size 0.4mm, Nozzle temp 250°C, Bed temp 100°C, Print speed 45mm/s, Infill 100%, Infill angle ±45°

试样打印参数: 流量 50% 喷嘴大小 0.4mm, 喷嘴温度 250° C, 底板加热 100° C, 打印速度 45mm/s, 填充率 100%, 填充角度 ±45°

Recommended printing conditions

建议打印参数

| | |
|---------------------------------------|--|
| 喷头温度 Nozzle temperature | 240-280°C |
| 建议喷嘴大小 Recommended nozzle diameter | ≥0.4mm |
| 建议底板材质 Recommended build surface | 玻璃、PEI 膜或涂抹 PVP 固体胶 PEI Film or Coating with PVP glue |
| 底板温度 Build plate temperature | 80-110°C |
| Raft 间距 Raft separation distance | 0.18-0.2mm |
| 冷却风扇 Cooling fan speed | 0-50% |
| 打印速度 Print speed | 30-90 mm/s |

Additional suggestions:

1. Since ASA-Aero adopts the 'on-demand foaming' technology, the filament will continue to expand in the nozzle after being heated during the printing process. Therefore, it will cause unavoidable stringing during the nozzle movement. Even adjusting the retraction setting in the slicing software cannot solve this problem. Based on the above, it is recommended to turn off the retraction setting.
2. Because ASA materials have a high glass transition temperature, a certain ambient temperature

(40-70°C) is required during printing to release the internal stress of the printed parts and reduce warping. When printing thin-walled models without any form of insulation, it is recommended to use nozzles with a diameter of 0.6mm or more to ensure the strength of printed parts and reduce shrinkage.

3. When printing with ASA-Aero filaments, please place the enclosed printer in a ventilated environment.

其他建议:

1. 由于 ASA-Aero 采用了“在线发泡”的技术，耗材在喷头内部受热后就会迅速膨胀，造成难以避免的拉丝现象，切片软件中的回抽设置无法起到明显的作用，甚至建议关闭回抽设置。
2. 由于 ASA 类材料具有较高的玻璃化转变温度，在打印时需要一定的环境温度（40-70° C），以释放打印件的内应力减少翘曲；在无保温的条件下，打印单层薄壁模型时，建议使用直径 0.6mm 及以上喷嘴打印，以保证强度和减小收缩现象产生。
3. 在打印 ASA-Aero 时，请将打印机在封闭的情况下放置在通风环境中。