Phaetus® FDM Printing Material
Technical Data Sheet

aeForce™ PC/ABS-FR

Flame Retardant PC/ABS alloy 3D Printing Filament

阻燃 PC/ABS 3D 打印材料

Product highlights

产品亮点

- **Halogen-free flame retardants**

  aeForce™ PC/ABS-FR is an excellent flame-resistant material which is based PC/ABS. By adding non-halogen flame retardant, PC/ABS has excellent self-extinguishing performance, and the flame-retardant grade can reach UL94 V-0 level (2mm). Compared with materials with halogen flame retardants, aeForce™ PC/ABS-FR will not release much smoke and toxic gases after burning. Therefore, aeForce™ PC/ABS-FR is safer and more environmentally friendly, while still maintaining the excellent mechanical properties and heat resistance of PC/ABS.

- **无卤阻燃**

  aeForce™ PC/ABS-FR 是一款优秀的防火材料，以 PC/ABS 基材，通过添加无卤阻燃剂，使材料具有优秀的自熄性能，阻燃等级可达 UL94 V-0 级（2mm）。相比于添加卤素阻燃剂的材料，aeForce™ PC/ABS-FR 燃烧后不会释放大量烟雾和有毒气体，更加安全环保，同时仍然保留了 PC/ABS 优秀的机械性能和耐热性。

Product details

产品详情

Color: Natural

Diameter: 1.75mm

Net Weight: 1kg, 2.5kg

Material Properties

物性表

测试项目 Property	测试方法 Test Method	典型值 Typical Value
密度 Density	ISO 1183	1.19 g/cm³
玻璃化转变温度 Glass transition temperature	ISO 11357	105°C
熔融指数 Melt index	250°C，2.16kg	25 g/10min
热变形温度（X-Y） Heat deflection temperature (X-Y)	ISO 75：Method A ISO 75：Method B	83°C (1.8MPa) 88°C (0.45MPa)
拉伸屈服强度（X-Y） Tensile yield strength (X-Y)	ISO 527	52.51 ± 0.28 MPa
屈服点伸长率（X-Y） Elongation at Yield (X-Y)		3.38 ± 0.02 %
杨氏模量（X-Y） Young's modulus (X-Y)		2588.73 ± 64.81 MPa
拉伸断裂强度（X-Y） Tensile breaking strength (X-Y)		48.99 ± 1.20 MPa
断裂伸长率（X-Y） Elongation at break (X-Y)		5.55 ± 0.99 %
拉伸断裂强度（Z） Tensile breaking strength (Z)	ISO 527	34.26 ± 0.84 MPa
杨氏模量（Z） Young's modulus (Z)		2302.81 ± 46.92 MPa
断裂伸长率（Z） Elongation at break (Z)		1.88 ± 0.11 %
弯曲强度（X-Y） Bending strength (Z)	ISO 178	85.95 ± 0.83 MPa

弯曲模量（X-Y） Bending modulus (X-Y)		2504.55 ± 22.88 MPa
缺口冲击强度（X-Y） Charpy impact strength (X-Y)	ISO 179	8.39 ± 0.46 kJ/㎡
UL 阻燃等级 UL Flame-retardant Grade		
2㎜ 厚度 2mm thickness	UL94	V-0
2.5㎜ 厚度 2.5mm thickness		5VB

Specimens printed under the following conditions: Nozzle size 0.4mm, Nozzle temp 250°C, Bed temp 110°C, Chamber temp 55°C, Printing speed 45mm/s, Infill 100%, Infill angle ±45°.

试样打印参数：喷嘴大小 0.4㎜，喷嘴温度 250° C，底板加热 110° C，腔体温度 55℃，打印速度 45㎜/s，填充率 100%，填充角度±45°

退火条件：90℃，退火 4 小时

Recommended printing conditions

建议打印参数

喷头温度 Nozzle temperature	240-270°C
建议喷嘴大小 Recommended Nozzle diameter	≥0.2mm
建议底板材质 Recommended build surface treatment	玻璃、PEI 膜或 PC 膜 Glass、PEI Film or PC Film
底板温度 Build plate temperature	100-110°C
腔体温度 Chamber temperature	40-70°C
Raft 间距 Raft separation distance	0.18-0.2 mm
冷却风扇 Cooling fan speed	0-20%

打印速度 Printing speed	30-300 mm/s
回抽距离 Retraction distance	1-3 mm
回抽速度 Retraction speed	1800-3600 mm/min

Additional suggestions：

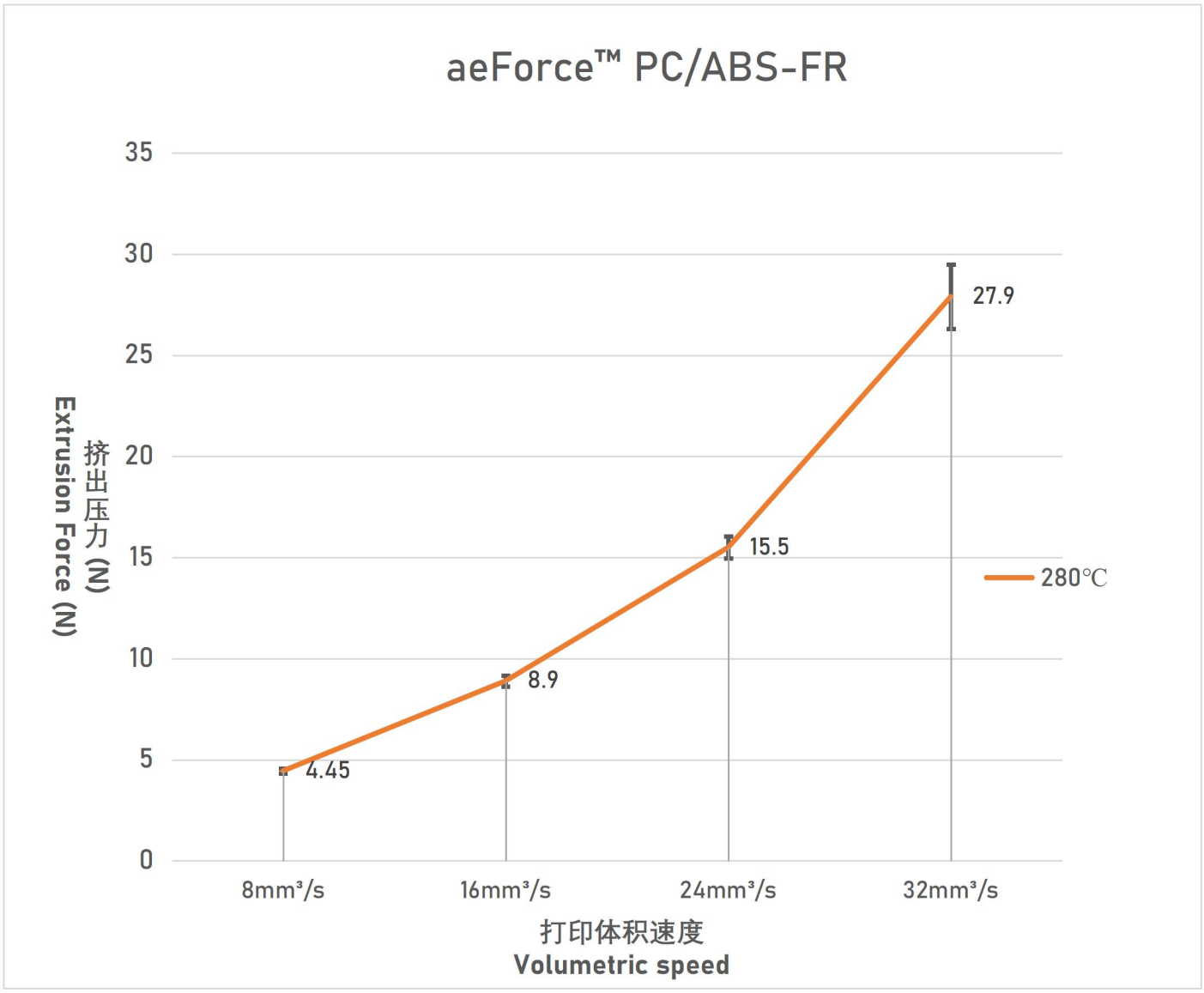
1. PC/ABS-FR filament is sensitive to moisture and can easily have stringing during printing. To reduce the stringing and surface roughness effectively, keep your filament in a dry box and control relative humidity to below 15%. If the filament has absorbed moisture already, dry the filament in an oven at 75°C for 4-6 hours.
2. It is recommended to place the printer in a well-ventilated area during printing PC/ABS-FR filament.

其他建议：

1. PC/ABS-FR 打印温度较高，对水分较敏感，在打印过程中将线材放入干燥盒内，相对湿度控制在 15%以下，可有效减少拉丝、表面粗糙等现象。如果耗材已吸潮，可以使用烘箱在 75℃进行 4-6 小时的烘干处理。
2. 建议在打印 PC/ABS-FR 耗材时将 3D 打印机放置在通风环境中。

Extrusion Force vs Print Volumetric Speed Test

挤出压力与打印流量速度测试



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

测试参数：12mm 长度铜制加热块，BMG 挤出机，Phaetus 硬化钢喷头，喷嘴大小 0.4mm，层高 0.2mm。