aeForce™ FDM Printing Material
Technical Data Sheet

aeForce™ ABS-ESD

Electrostatic discharge-safe filament

防静电型 ABS 耗材

Product Advantages

产品亮点

- **Odorless**

Compared with other ABS filaments, ABS-ESD has a much lower odor.

- 低气味

与同类产品相比具有更低的气味性。

- **Controllable surface resistivity**

The surface resistivity of the printed part fall in the range of ESD-safe or dissipative material category (10^5 to $10^9\Omega$/sq).

- 可控表面电阻率

打印件的表面电阻率在静电安全和静电消散型类别范围内。

Product Description

产品简介

aeForce™ ABS-ESD is an ESD-safe filament based on multiwalled carbon nanotube -filled ABS. Thanks to its excellent printability and electrostatic dissipative properties, ABS-ESD is ideal for general manufacturing and electronic industry.
aeForce™ ABS-ESD 是一款基于多壁碳纳米管填充的 ABS 防静电材料，得益于该材料优秀的可打印性和静电耗散特性，ABS-ESD 适用于常规制造业和电子工业。

The main raw material of aeForce™ ABS-ESD is an ABS resin synthesized by continuous bulk polymerization technique. Thanks to this advanced production process, the residual amount of solvents and monomers used in the production process in the final ABS product is so low that the filament has a low odor during printing.
aeForce™ ABS-ESD 选用的主要原料是一款由连续本体法合成 ABS 树脂，得益于这种先进的生产工艺，生产过程中使用的溶剂和单体在最终 ABS 成品中的残留量极低，因此耗材在打印过程中的具有较低的气味性。

Available

产品详情

Color: Black

Diameter: 1.75mm/ 2.85mm

Net wet: 1KG

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	1.05 g/cm³
玻璃化转变温度 Glass transition temperature	ISO 11357	80°C
熔融指数 Melt index	280°C, 5kg	2 g/10min
热变形温度 Determination of temperature	ISO 75：Method A ISO 75：Method B	70°C (1.8MPa) 75°C (0.45MPa)
拉伸模量 Young's Modulus （X-Y）	ISO 527	2352.06±30.47 MPa
拉伸断裂强度 Tensile breaking strength （X-Y）		34.00±0.16 MPa
断裂伸长率 Elongation at break （X-Y）		2.21±0.08 %

拉伸强度 Tensile breaking strength （Z）	ISO 527	19.38±0.16 MPa
拉伸模量 Young's Modulus （Z）		1759.74±55.60 MPa
断裂伸长率 Elongation at break （Z）		1.58±0.09 %
弯曲强度 Bending strength （X-Y）	ISO 178	54.28±0.56 MPa
弯曲模量 Bending Modulus （X-Y）		2337.91±20.62 MPa
缺口冲击强度 Charpy impact strength （X-Y）	ISO 179	6.47±0.6 KJ/㎡

试样打印参数：喷嘴直径 0.4mm，喷嘴温度 260℃，底板加热 80℃，打印速度 100mm/s，填充率 100%，填充角度±45°

Specimens printed under the following conditions: Nozzle size 0.4mm， Nozzle temp 260°C, Bed temp 80°C, Print speed 100mm/s, Infill 100%, Infill angle ±45°

测试方法 **Test Method**	**ANSI ESD S11.11**			
表面电阻率 Ω/sq Surface Resistivity	240°C	250°C	260°C	270°C
X-Y	10^8	10^7	10^6	10^5
X-Z	10^9	10^8	10^7	10^6

试样打印参数：样件厚度 2mm，喷嘴直径 0.4mm，底板加热 80°C，打印速度 100mm/s，填充率 100%，填充角度±45°

Specimens printed under the following conditions: Specimens thickness 2mm,Nozzle size 0.4mm,Bed temp 80°C, Print speed 100mm/s, Infill 100%, Infill angle ±45°

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	≥0.2 mm
建议底板材质 Recommended build surface treatment	Glass、PEI Film or PC Film
底板温度 Build plate temperature	80-90°C
Raft 间距 Raft separation distance	0.16-0.18 mm
冷却风扇 Cooling fan speed	Off-30 %
打印速度 Print speed	30-150 mm/s
回抽距离 Retraction distance	1-5 mm
回抽速度 Retraction speed	1800-3600 mm/min

Additional Suggestions:

1. Compared with PLA, PETG and other materials, ABS materials need a higher chamber temperature to help release the residual stress during the printing process. Please keep the printer chamber closed during the printing process. It can effectively avoid printed parts from warping and cracking. If the device has a heated chamber, it is recommended to set the temperature of heated chamber between 40-60°C.
2. If the ABS-ESD filament has been unpacked for a long time and the printing quality starts to degrade during the printing process, please dry the filament at 70-80°C for 4-6 hours before printing.
3. Although ABS-ESD has much less odor compared with similar products, it is still recommended to place the printer in a well-ventilated area during printing.

注意事项:

1. ABS-ESD 材料相比 PLA，PETG 等材料在打印过程中需要有较高的环境温度来帮助释放零件成型过程中的残余应力，在打印过程中请将打印机保持封闭状态，可以有效避免打印零件出现翘曲和开裂现象。

如果设备具有加热腔功能，建议将加热腔温度设置在 40-60°C 之间。

2. 长期打开包装后的 ABS-ESD 线材，如打印过程中发现打印质量下降，请将线材置于 70-80℃条件下干燥 4-6h。
3. 虽然 ABS-ESD 与同类产品相比气味更小，但仍然建议在打印时将打印机放置在通风环境中。