Electrifi Conductive Filament

Recommended Printing Parameters (FFF/FDM)

Electrifi is a soft, highly conductive copper–polymer composite. These parameters are intended to maximize print reliability and electrical performance rather than print speed.

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1. Printer & Hardware Configuration (Critical)

- **Extruder type:**
  - **Direct-drive extruder strongly recommended**
  - Bowden-style extruders not recommended
  - AMS / multi-material feed systems not compatible
- **Filament path:**
  - Short, straight, and well-constrained
  - Avoid sharp bends, long guide tubes, or excessive drag
- **Nozzle:**
  - Brass or hardened steel
  - **Minimum diameter:** 0.4 mm
  - **Preferred diameter:** 0.6 mm or larger for improved reliability

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2. Temperature Settings

Parameter	Recommended Range
Nozzle temperature	**140–180 °C**
Bed temperature	**≤ 50 °C**
Chamber temperature	Ambient (enclosure not required)

Notes:

- Avoid extended dwell time at nozzle temperature to reduce heat creep
- Where possible, lower standby nozzle temperatures in start G-code

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3. Print Speed & Motion

Parameter	Recommended Value

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Print speed	**10–30 mm/s**
First-layer speed	**5–15 mm/s**
Travel speed	Moderate
Acceleration	Low to moderate

Lower speeds reduce compressive buckling and improve dimensional and electrical consistency.

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4. Retraction & Extrusion Control

Parameter	Recommendation
Retraction	**Minimize or disable**
Retraction distance	≤ 0.5 mm (if required)
Retraction speed	Slow
Coasting / wipe	Use cautiously

Excessive retraction is a common cause of jams when printing soft conductive filaments.

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5. Layer & Geometry Settings

Parameter	Recommended Range
Layer height	**0.2–0.3 mm**
Line width	≥ nozzle diameter (preferably +10–20%)
Wall count	≥ 2 perimeters
Infill	100% for conductive features

Electrical performance improves with:

- Increased trace width and thickness
- Shorter conductor lengths
- Fewer inter-layer interfaces

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6. Cooling

- **Part cooling fan:**
    - Low to moderate (0–40%)
    - Avoid aggressive cooling during extrusion

- **Hotend cooling:**
    - Strong, continuous heat-break cooling is essential

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7. Material Handling

- Electrifi is **soft and flexible**
- Avoid tight spool holders or high filament tension
- Ensure smooth feeding with minimal drag
- Drying is typically not required, but filament should be kept clean and dry

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8. Recommended Applications

- Single-material conductive prints
- Embedded conductors and traces
- Conductive sockets and contact features
- Heaters, antennas, and EMI structures

Not recommended:

- High-speed printing profiles
- Automatic material switching systems
- Long Bowden-fed setups

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9. Practical Note

Electrifi performs best when treated as a **conductive structural material**, not a solder replacement. Electrical performance is strongly influenced by **geometry, contact pressure, and interface design**, not just bulk conductivity.

For application notes, troubleshooting guidance, or printer-specific profiles, please contact Multi3D, Inc.