Spectrum FILAMENTS

TECHNICAL DATA SHEET

PLA Conductive

MATERIAL PROPERTIES

Density	1.35 g/cm³	ISO 1183
Mechanical		
CHARPY impact strength Unnotched*	NB kJ/m²	ISO 179-1eU
CHARPY impact strength Notched*	8,7 kJ/m²	ISO 179-1eA
Tensile elongation At yield (5 mm/min)*	7,4%	ISO 527 (1)
Tensile elongation At break (5 mm/min)*	11,8%	ISO 527 (1)
Tensile strength At yield (5 mm/min)*	31,2 MPa	ISO 527 (1)
Tensile strength At break (5 mm/min)*	24,6 MPa	ISO 527 (1)
Elastic modulus Tensile (1 mm/min)*	1480 MPa	ISO 527 (1)
Electrical properties		
Electrical resistivity (surface, dry)	1E1 ohm	ASTM D 257

* at 23°C, injection moulding

GUIDELINE FOR PRINT SETTINGS*

Nozzle temperature - standard speed	210-230°C
Bed temperature	40-50°C
Active cooling fan	Up to 100%
Shell thickness**	0.4 - 2.7 mm
Layer height**	0.5 - 3.0 mm
Closed chamber	Not necessary
Dry box	No
Ruby or hardened nozzle	Yes
Drying (if wet)	recommended***
Adhesive	not necessary (if you need increased adhesion or prevent warping: glue stick, Dimafix, 3DLac, Magigoo)

* settings are based on a 0.4mm nozzle
** depending on the geometrical complexity
*** at least 6h at 50°C using a hot dry air oven

DESCRIPTION

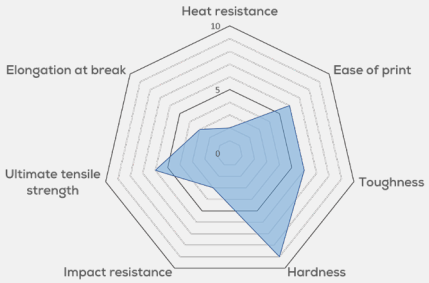
Spectrum PLA Electrically Conductive is a specialized technical filament developed for applications where electrical conductivity is important, combined with the ease of printing typical of PLA. The material is based on a PLA polymer modified with carbon nanotubes (CNT), which significantly reduce surface resistivity – making it suitable for components that require basic electrical conduction.

FEAUTURES

- Volume resistivity as low as ~97 Ω·m
- Electrical conductivity
- Dimensional stability and ease of printing
- Matte finish that reduces visible layers

STORAGE AND SHELF LIFE

Filament should be stored in a dry room at room temperature. Recommended storage temperature is ca. 18-25°C (64.4 -77.0°F). Keep out of moisture, sunlight and direct heat. When stored properly, product has a shelf life of 24 months.



SUPPORT

If you have any questions or experience any issues, please do not hesitate to contact us at **support@spectrumfilaments.com**

PLA Conductive

VOLUME RESISTIVITY MEASUREMENTS

To verify the conductive properties, tests were conducted using a 3D-printed specimen measuring 4× 4 × 120 mm (100% infill, 0.2mm layer height, BambuLab P1S), under 10 V voltage and three different extrusion temperatures: 210°C, 220°C, and 230°C. The measured volume resistivity values were:

- 210°C: 120 Ω·m
- 220°C: 103 Ω·m
- 230°C: 97 Ω·m

These results show that increasing the extrusion temperature improves electrical conductivity. Higher temperatures allow better dispersion of carbon nanotubes within the print structure, resulting in lower volume resistivity. For users, this means that for parts where conductivity is critical, it's recommended to use higher extrusion temperatures (up to 230°C), while ensuring compatibility with their printer's hardware.