

CONDUCTIVE GRAPHENE FILAMENT



Conductive Graphene Filament, a material by Graphene 3D Lab, is specifically designed to allow you to 3D print electrically conductive components using almost any commercially available desktop 3D printer! By purchasing this filament, you agree that you have read and agree to the product description below, including the handling and disclaimer statements.

PROPERTIES

- Volume Resistivity: 0.6 ohm-cm
- Color: Black
- Diameter: 1.75 mm
- Size: 100 grams
- Graphene-enhanced for superior conductivity and improved mechanical properties
- PLA-based



ELECTRICAL CONDUCTIVITY

Our Conductive Graphene Filament offers a volume resistivity of 1 ohm-cm. Volume resistivity is the measure of a material's resistance to electricity within a cubic centimeter of material. In order to determine if the material will work for your project, you will have to keep in mind that the resistivity will change depending upon your print. It is suggested that our filament can be used for the applications below.



HIGH STRENGTH

Conductive Graphene Filament may also be used for applications which require superior strength to ABS and PLA.

APPLICATIONS

SENSORS

Conductive Graphene Filament can be used to create capacitive (touch) sensors used in a wide range of electronics which you interact with on a daily basis; it is an excellent material for designing human interface devices! Capacitive sensing can also be used to measure proximity, position, humidity, fluid levels, and acceleration.

CONDUCTIVE TRACES

Another application of Conductive Graphene Filament is in the creation of electrically conductive circuitry for use in electronics. We love that 3D printing is a push-button process and we aim to keep it that way. Traditionally, 3D printing enthusiasts needed to add circuitry to their creation after it was printed in plastic, using copper wire; by offering a conductive filament, you can print graphene wiring simultaneously with your build process!

PROJECTS INCLUDE:

- Gaming controllers
- Digital keyboards
- Trackpads
- Drum Machines
- MIDI controllers

PROJECTS INCLUDE:

- Interfacing computers, Arduino boards, and other components
- Powering LED's
- Wearable electronics

NOTE: *The electrical resistance of a circuit must be considered in order to successfully use Conductive Graphene Filament in electronics applications; specifically, the filament is designed for low-current applications.*



ELECTROMAGNETIC AND RADIOFREQUENCY SHIELDING

The superior conductivity offered with our Conductive Graphene Filament is not only excellent for 3D printed circuitry and sensors – it also means our filament is wholly capable of use in EMI and RF shielding applications critical for use in a range of industries, including:

- *Telecommunications*
- *Hospital equipment*
- *Medical devices*
- *Enclosures and packaging*
- *Aerospace and Automotive*



EMI/RF shielding is used to block the electromagnetic field and radio frequency electromagnetic radiation within a space; it is important to use EMI and RF shielding in a hospital, laboratory, or aerospace setting to protect against competing signals because they may lead to equipment giving false measurements. EMI/RF shielding accomplishes this by blocking AM, FM, TV, emergency services, and cellular signals. Conductive Graphene Filament is ideal for designing EMI/RF shields used in highly- customized items.

HIGH-STRENGTH MECHANICAL AND FUNCTIONAL PARTS

Because Conductive Graphene Filament is mechanically stronger than ABS and PLA, it can be used to 3D print functional parts such as: hooks, hand-tools, and parts which require tooling, including drilling.

PRINTING PARAMETERS:



- *Recommended extruder temperature: 220°C*
- *Recommended platform temperature: 50°C*
- *Recommended print speed: 1800 mm/min Nozzle size: > 0.5mm*
- *Extrusion multiplier: 1.1*
- *Conductive Graphene Filament was tested using a direct drive 3D printing extruder. We do not guarantee that Conductive Graphene Filament will be compatible with non-direct drive 3D printers, such as delta models.*
- *Avoid leaving filament in a heated nozzle for an extended period of time.*

HANDLING

Our filament is shipped in a vacuum-sealed package with a desiccant packet. Conductive Graphene Filament should be stored in a dry environment away from dust and other particles. User should avoid extended exposure to moisture. We recommend storing in an enclosed container with a desiccant packet. 3D printers, especially their nozzles, should always be maintained, and should be cleaned before and after use of Conductive Graphene Filament to avoid complications during printing. Users are also instructed to wash their hands before and after use of Conductive Graphene Filament.

Conductive Graphene Filament softens at high-temperatures (~50°C) and is designed to be used with prints intended for room-temperature operation; it is intended for low-voltage and low-current projects only. Do not exceed 12 volts and avoid using the filament for power supply's that exceed 100 mA. Resistivity of one meter of 1.75 mm filament is 4 kOhm's. Keep in mind that a major factor influencing resistivity is contact resistivity, so shortening the length of the trace will not linearly correlate to a decrease in resistivity.

If using this material for dual-extrusion printing, we recommend using in conjunction with PLA. A 3D printer nozzle larger than 0.5 mm is suggested for use of Conductive Graphene Filament.

DISCLAIMER

Our materials and products may be used by skilled, experienced users, and at their own risk. To the fullest extent permissible by all applicable laws, we hereby disclaim any and all responsibility, risk, liability, and damages arising out of any death or personal injury resulting from the assembly or use of our products and materials. Specifications are subject to change without notice.