

Conductive Silver Epoxy

Graphene Empowered Conductive Silver Epoxy Adhesive for Electronic Bonding Applications

Product Description

The Silver/Graphene Conductive Epoxy Adhesive is an electronic grade adhesive that combines high electrical and thermal conductivity with excellent adhesion power. It possesses high performance bonding formulation, so it provides optimum mechanical properties. Unlike one-part epoxy, it can be cured at room temperature and does not require frozen storage. Part A & part B both have silver color.

Applications & Usages

Nanotech Energy two-part conductive epoxy adhesive can be used to repair heat sensitive devices, bond electronic components, and solder replacement. Our adhesive can be cured at room temperature if necessary. Curing at higher temperatures can speed up curing time and increase bonding performance and electrical conductivity. The optimum cure rate is 24 hours at 23°C followed by 3 hours at 70°C.

Product features include

- High adhesive strength
- Excellent electrical conductivity: 0.001 Ω·cm
- High thermal conductivity: 4.53 W/mK
- Convenient 1-to-1 mixing ratio by volume or weight
- Bonds metals, PCBs, glass, wood, and fabrics

Item #: XXXXXX	
Product Specifications*	
Properties of the Cured Adhesive	
Color	Silver
Resistivity	0.0011 Ω·cm (4-point probe)
Thermal Conductivity	4.53 W/m.K (TPS method)
Solid Content in Cured Adhesive	~85%
Lap Shear Strength, Aluminum	1043±108 psi (ASTM D1002)
Tensile strength	2081±282 psi (ASTM D638)
Modulus (Young's)	212935 psi

*All numbers listed in this sheet have been confirmed by third party testing.

Properties of Uncured Adhesive

Properties	Value
Color	Silver
Density	Part A: 2.66 g/cm ³ Part B: 2.60 g/cm ³
Viscosity at 25 °C	Part A: Smooth Paste-Like Part B: Smooth Paste-Like

Curing & Work Schedule

Properties	Value
Working Life	>30 min
*Shelf Life	Projected >1 year
Full Cure (at 25 °C [77F])	48 hours
Heat Cure 70 °C	3 hours
Storage Temperature	16 to 27 °C [60-80 °F]

*This test is still ongoing, and more data will be provided on a regular basis.

Usage Parameters

Properties	Value
Mix Ratio by Volume	1:1
Mix Ratio by Weight	1:1

Compatibility

Adhesion – This two-component epoxy shows great bonding strength with materials such as metals, PCB, fabrics, wood and concrete.

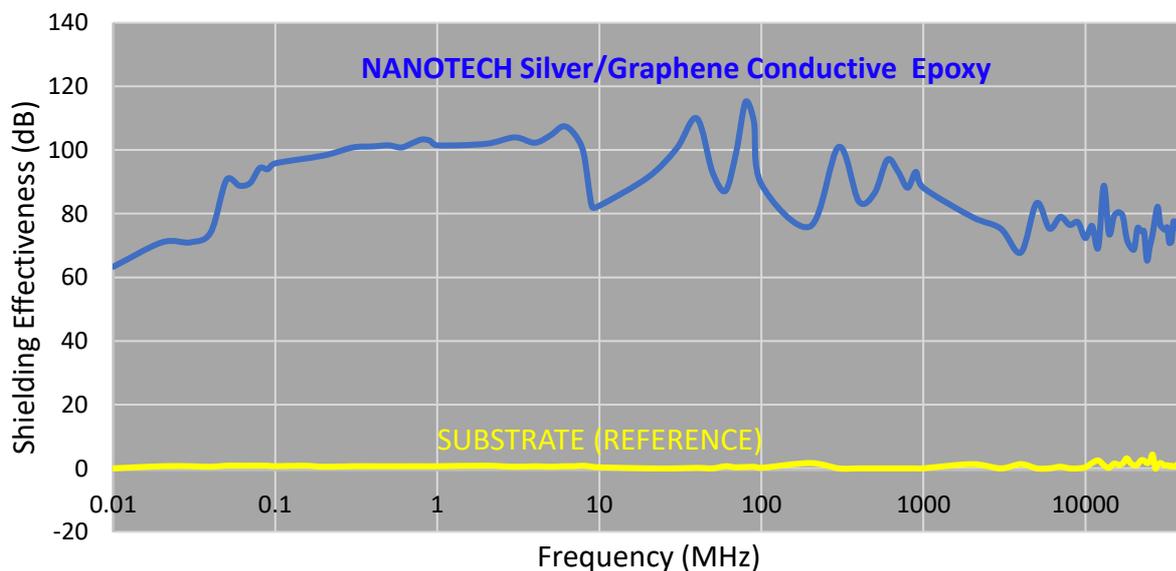
Conductivity vs Temperature

Though the epoxy system can be cured at room temperature, curing at higher temperatures can speed up curing time and increase bonding performance and electrical conductivity. The optimum cure rate is 24 hours at 23°C followed by 3 hours at 70°C.

EMI Shielding Effectiveness

The silver/graphene conductive epoxy can also be used for EMI shielding purposes. The adhesive can be applied through different techniques to the outer surface of gaskets, seals or housings for which it is desired to impart EMI or RFI shielding properties. The thickness of the coating depends on the particular application and the degree of shielding desired. See below for EMI shielding effectiveness of ~170 µm thick film of the conductive epoxy coated on a sheet of polyethylene terephthalate (PET).

Frequency	Shielding Effectiveness (dB)
(10 -100) KHz	83.28±12.03
(0.1 -10) MHz	99.90±6.67
(10 -100) MHz	97.7±10.89
100 MHz- 1 GHz	89.63±7.00
1 GHz – 40 GHz	75.87±4.99



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Preparation of Bonding Surfaces

All surfaces should be cleaned, degreased and dried to attain the maximum bonding. For coating on the metal surfaces, chemical etching is recommended to acquire optimum durability of joint.

Lap Shear Strength

Silver/Graphene Conductive Epoxy Adhesive was applied between the defined area of the aluminum strips, and the lap shear test was performed following the ASTM D1002 guidelines.

Tensile Strength

The tensile test was performed following the ASTM D638 guidelines. Tensile strength was calculated to be PSI.

Application Instructions

Dual-Barrel Syringe

1. Shake dual-barrel cartridges vigorously for 5-10 minutes or until the stainless-steel ball moves around freely inside the cartridge.
2. Apply mixing nozzle and dispensing gun. **As alternative, dispense Part A and Part B into the plastic container without mixing nozzle. Then, mix for 2 min and perform vacuum degassing for 5 min before applying on the surface.
3. The parts to be joined should be press together with just enough pressure to retain close contact during cure.
4. Cap tightly after use to preserve shelf life.

Product Offering

The conductive silver epoxy is available in dual-barrel cartridges.

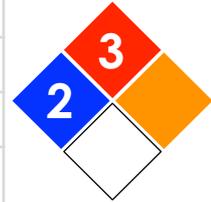
Storage

Store adhesive between 16 and 27 °C [60 and 80 °F] in a dry area. Shake/mix adhesive before use to ensure best results. Keep product away from heat and flames.

Health & Safety

Refer to Safety Data Sheet for more details.

Health:	2
Flammability:	3
Physical Hazard:	0
Personal Protection:	



Use in a well-ventilated area. Wear safety goggles, nitrile gloves, respirator and lab coat when handling adhesive. Do not ingest. Wash with soap and water to remove from skin.

Disclaimer

The information claimed is believed to be accurate. Nanotech Energy Inc. holds no guarantee to the accuracy of data and no liability in connection with damages when using the product.

****Vacuum degassing is recommended for the maximum bond strength of conductive adhesive.**

Revision Date: 3.9.2021

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