



Application Note

Conductive Coating Shielding Effectiveness Performance

Problem

Conductive coatings use in EMI shielding systems is expanding, due to the growing use of injection molded plastic enclosures and components in today's electronic devices and increasing electronic switching speeds. Plastics, by their very nature of being non-conductive, do not attenuate EMI and require shielding systems be incorporated to meet regulations and ensure reliable device performance. Faster semiconductor clock speeds increase the challenge for robust shielding systems, and electronic device form factors are continuing to shrink, which challenge the use of space consuming components such as ferrites, board mounted shield cans, and gaskets. Conductive coatings essentially consume no volume inside an electronic device and if applied properly, can assist the design engineer to meet ever shrinking cost budgets.

Cybershield Solution

Conductive coatings attenuate EMI at frequencies from 30 MHz to >10 GHz by reflecting and absorbing the source interference, either to shield emissions generated by the electronics inside device or to protect the electronics inside the device from ambient EMI. Generally, higher surface conductivity provides superior shielding effectiveness.

Conductive Coatings Description & Resistivity

Conductive Coating	Total Thickness	Resistivity Ohms/sq.
All-Over Plating (Copper/Nickel)	40-50 μ" (1.0-1.25 μm)	0.01-.02
Selective Plating (Copper/Nickel)	80-100 μ" (2.0-2.5 μm)	0.02-.03
Copper Paint	0.001" (0.025 mm)	0.015
Copper-Silver Hybrid Paint	0.005" (0.0125 mm)	0.015
Silver Paint	0.005" (0.0125 mm)	0.015
Aluminum or Copper – Stainless Steel Vacuum Deposition	20 μ" (0.5 μm)	0.1-2

Conductive Coating Shielding Effectiveness

Coating	Thickness	30 MHz	100 MHz	300 MHz	1GHz	5 GHz	10 GHz
All-Over Plating	40 μ" (1.0 μm)	90	108	104	120	113	87
Selective Plating	80-μ" (2.0 μm)	77	73	71	71	60	62
Copper Paint	0.001" (0.025 mm)	65	63	59	70	81	63
Copper-Silver Hybrid Paint	0.001" (0.025 mm)	78	73	72	69	85	70
Copper – Stainless Steel Vacuum Deposition	20 μ" (0.5 μm)	43	44	46	48	58	62
Aluminum Vapor Deposition	20 μ" (0.5 μm)	42	40	38	46	40	35

For more information about this data, Cybershield capabilities and/or to review your application requirements for metallized plastic, contact Cybershield or its sales representatives

Cybershield
 308 Ellen Trout Drive
 Lufkin, TX 75904
 214-227-3680

Email: sales@cybershieldinc.com

- Fabricate a full range of EMI shielding solutions – Electroless Plating and Conductive Paint
- Electroplating Copper, Nickel, Trivalent Chrome, including decorative plating on plastics and metal
- Offer engineering design assistance – plastic resin selection, metal coating specification and mechanical design recommendations
- Serve applications in volumes from 25 units per month to millions of units per month
- Provide extensive mechanical assembly services to its customers
- Manage entire supply chain, including plastic injection molding to provide customers with turnkey solutions, designed and manufactured to strict OEM requirements

EMI Shielding, ESD and Electroplated Coatings	Assembly Services
All-over & Selective Coverage Electroless Plating Copper, Nickel, Tin, Gold Electroplating Copper, Nickel, Trivalent Chrome Conductive Paint	Dispensed Gaskets (Conductive or Environmental) Insert Installation (Ultrasonic or Heat Staking) Decorative Paint Mechanical Assembly

Other Cybershield Plastic Metallization Systems



Plated Plastic
Router Chassis



Plated Plastic RF
Filter Housing



Plated Plastic
Shielded Connectors



EXACT™ 3D
Circuits