

Nickel Conductive Print

Description

841AR-15ML is an acrylic lacquer pigmented with conductive nickel flakes. The cured traces are durable and corrosion resistant. They adhere well to plastics and most electronic substrates. The product is best applied with a solvent-resistant brush.

This print repairs damaged traces on keyboards, game controllers, remote controls, mixing boards, and PCBs. It also creates conductive traces for prototyping, hobbies, or maker projects. It is great for making small connections in or between circuits, such as jumpers, through-holes, bridges, and links. It can also be used to increase the surface area of contacts by painting the area around them.

For applications requiring lower resistance, use the 842AR-15ML Silver Conductive Print. For a more economical alternative, use the 838AR-15ML Carbon Conductive Print.

Features and Benefits

- *Creates durable, reliable and conductive traces*
- *Resistivity of 0.0040 $\Omega \cdot cm$*
- *Dries in minutes at room temperature*
- *Good flexibility*
- *Toluene, xylene and MEK free*

Usage Parameters

Properties	Value
Touch dry or recoat time	2 min
Full cure @22 °C [72 °F]	24 h
Full cure @65 °C [149 °F]	30 min
Shelf life	3 y

Temperature Ranges

Properties	Value
Constant service temperature	-40–120 °C [-40–248 °F]
Intermittent temperature limit	-50–125 °C [-58–257 °F]
Storage temperature limits	-5–40 °C [23–104 °F]

Cured Properties

Electric & Magnetic Properties	Method	Value
Resistivity	Method 5011.5 in MIL-STD-883H	0.0040 Ω ·cm [250 S/cm]
Magnetic class	—	Ferromagnetic
Relative permeability	—	≥ 100

a) Surface resistance is given in Ω /sq and the corresponding conductance in Siemens (S or Ω).

Cured Properties

Physical Properties	Method	Value
Paint type	—	Lacquer (thermoplastic)
Color	Visual	Dark grey
Abrasion resistant	—	Yes
Blister resistant	—	Yes
Peeling resistant	—	Yes
Water resistant	—	Yes

a) HVLP spray gun application on ABS coupons.

Cured Properties

Mechanical Properties	Method	Value
Adhesion (ABS)	ASTM D 3359	5B
(PC)	ASTM D 3359	5B
(PVC)	ASTM D 3359	5B
(Polyamide)	ASTM D 3359	5B
(Glass)	ASTM D 3359	0B
(Copper)	ASTM D 3359	0B
(Aluminum)	ASTM D 3359	0B
(Stainless steel)	ASTM D 3359	0B
(FR4)	ASTM D 3359	5B
(PP)	ASTM D 3359	0B
Pencil hardness (ABS)	ASTM D 3363	3H, Hard
Environmental & Ageing Study	Method	Value
Salt fog test @35 °C [95 °F], 96 h ^{a)}	ASTM B 117-2011	
Surface resistance before	MG-ELEC-120	380 mΩ/sq
Surface resistance after	MG-ELEC-120	510 mΩ/sq
Cross-hatch adhesion	ASTM D 3359-2009	5B
Cracking, unwashed area	ASTM D 661-93	None
Visual color, unwashed area	ASTM D 1729-96	Slightly darker

a) HVLP spray gun application on ABS coupons.

Surface Resistance by Coating Thickness

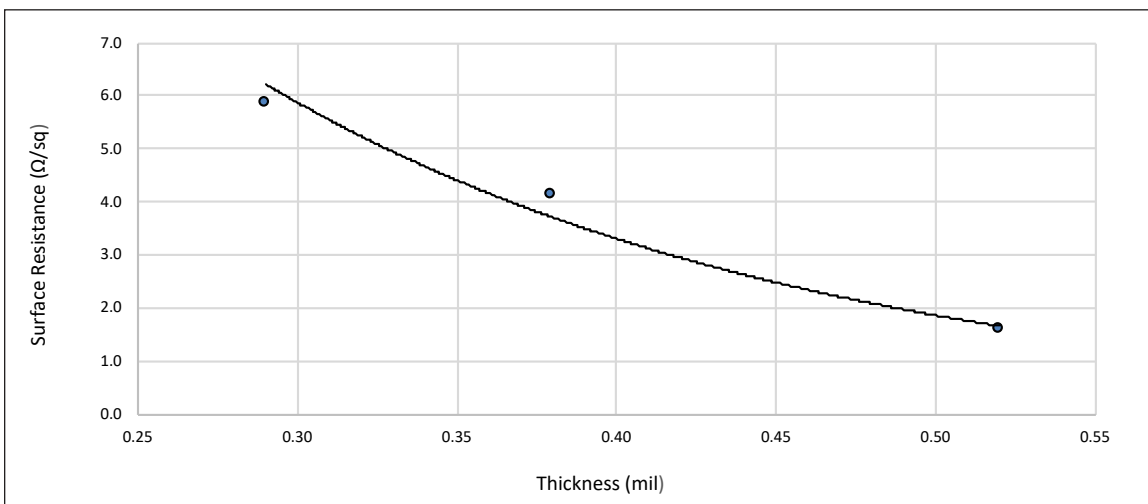


Figure 1. Nickel conductive coating surface resistance at different thicknesses (the dots indicate typical successive coat thicknesses)

Uncured Properties

Physical Properties	Method	Value
Color	Visual	Dark grey
Odor	—	Acetone-like
Viscosity @25 °C [77 °F] ^{a)}	Brookfield viscometer	1 460 cP [863 mm ² /s]
Density @25 °C [77 °F]	ASTM D 1475	1.7 g/mL
Flash point	—	-17 °C [1.4 °F]
Solids content (wt/wt)	Calculated	57%

a) Brookfield viscometer at 20 RPM with spindle LV S62.

Compatibility

Chemical Resistance—Nickel has good resistance to oxidation in a variety of corrosive environments, including marine environments. In normal atmosphere or freshwater, nickel corrodes less than 0.0025 mm per year. Since nickel forms a passive protective film on its surface that slows down or stops further corrosion, the passive nickel resists corrosion better than pure copper fillers. In addition, nickel is harder than its silver or copper filled counterparts, providing greater durability.

The thermoplastic resin is dissolved by common paint solvents like toluene, xylene, acetone and MEK. This allows for easy repair and rework of the coating, but makes it unsuitable for use in solvent-rich environments.

Adhesion—The coating adheres to most plastics used to house printed circuit assemblies; however, it is not compatible with contaminants like water, oil, or greasy flux residues that may affect adhesion. If contamination is present, first clean the surface to be coated with MG Chemicals 824 Isopropyl alcohol.

Storage

Store between -5 and 40 °C [23 and 104 °F] in a dry area, away from sunlight.

Health and Safety

Please see the 841AR-Liquid Safety Data Sheet (SDS) for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

1. Mix coating thoroughly by shaking the jar or with a mixing stick.
2. Apply a thin, even layer using a solvent-resistant brush.

Cure Instructions

Room temperature cure:

- Let cure at room temperature for 24 h.

Heat cure:

- Put in oven at 65 °C [149 °F] for 30 min.

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Net Weight	Packaged Weight
841AR-15ML	Jar	12 mL [0.4 fl oz]	20.2 g [0.71 oz]	80.0 kg [0.18 lb]

Thinners & Conductive Coating Removers

- *Thinner: Cat. No. 435-1L*
- *Thinner 1: Cat. No. 4351-1L*

Technical Support

Please contact us regarding any questions, suggestions for improvements, or problems with this product. Application notes, instructions and FAQs are located at www.mgchemicals.com.

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