

Silver Conductive Pen

Description

The 842AR-P pen dispenses an acrylic lacquer pigmented with highly conductive silver flakes. The cured traces are durable and corrosion resistant. They adhere well to plastics and most electronic substrates. The traces are flexible, but the product works best on a smooth, flat, hard surface. The valve tip opens when pressed against the surface, and the flow is controlled by squeezing the barrel.

This pen 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 where high conductivity is not required, the 838AR-P Carbon Conductive Pen and the 841AR-P Nickel Conductive Pen provide economical alternatives.

Features and Benefits

- *Creates durable, reliable and conductive traces*
- *Resistivity of 0.0001 $\Omega \cdot cm$*
- *Typical trace width: 0.9 mm*
- *Dries in 1 minute at room temperature*
- *Toluene, xylene and MEK free*

Usage Parameters

Properties	Value
Touch dry	1 min
Full cure @22 °C [72 °F]	24 h
Full cure @65 °C [149 °F]	30 min
Shelf life	3 y
Typical trace width	0.9 mm
Theoretical pen coverage ^{a)}	≤450 cm ² [≤70 in ²]

a) Estimate based on a coat thickness of 25 µm [1.0 mil] and 100% transfer efficiency

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	0.0001 Ω ·cm [9337 S/cm]
Surface resistance ^{a)} 1 coat @0.9 mil 2 coats @1.8 mil 3 coats @2.9 mil	Square probe Square probe Square probe	<0.01 Ω /sq ^{b)} <0.01 Ω /sq ^{b)} <0.01 Ω /sq ^{b)}
Magnetic class	—	Diamagnetic (non-magnetic)
Relative permeability	—	<1.0
Physical Properties	Method	Value
Paint type	—	Lacquer (thermoplastic)
Color	Visual	Metallic silver grey
Abrasion resistant	—	Yes
Blister resistant	—	Yes
Peeling resistant	—	Yes
Water resistant	—	Yes
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	1B
(FR4)	ASTM D 3359	5B
(PP)	ASTM D 3359	1B
Pencil hardness (ABS)	ASTM D 3363	3H, hard

NOTE: Values are based on liquid format. Pen format values may vary slightly.

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

b) Readings less than 0.01 Ω /sq are below the detection limit of the hand-held multimeter and square probe method.

Uncured Properties

Physical Properties	Method	Value
Color	Visual	Metallic silver
Odor	—	Acetone-like
Viscosity @25 °C [77 °F] ^{a)}	Brookfield viscometer	873 cP [503 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	61%

a) Brookfield viscometer at 30 RPM with spindle LV S62.

Compatibility

Chemical Resistance—The silver filler is resistant to oxidation, except in environments that contain contaminants like H₂S or ozone which tarnish its surface. Unlike many other metal oxides, silver oxide remains conductive so degradation due to oxidation is not as bad.

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. Store pen with the tip up after use.

Health and Safety

Please see the 842AR-Pen Safety Data Sheet (SDS) for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

Pen:

1. Shake pen vigorously until the ball moves freely inside.
2. Hold pen at angle and depress tip against surface.
3. Draw pen across surface while gently squeezing barrel.
4. Let dry 1 min before handling or heat cure.
5. Clean tip, replace cap and store tip up after use.

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
842AR-P	Pen	5 mL [0.16 fl oz]	8.69 g [0.3 oz]	33 g [0.07 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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