

## Conductive Pens — Silver, Carbon, and Nickel



### Easily draw and repair conductive traces

#### **Features and Benefits:**

- Acrylic lacquer pigmented with either carbon powder, nickel flake, or silver flake.
- Create durable, corrosion resistant, conductive connections
- Typical trace width: 1.0 mm
- Tack free in minutes
- Adheres to copper, aluminum, ceramics, wood, and most electronic substrates
- Adheres to ABS, PLA, and other 3D printed plastics
- Toluene and xylene free

#### **Applications:**

- Create and repair conductive traces in prototype or malfunctioning circuits.
- Designed for use on smooth, flat, hard surfaces

#### **We offer a selection of three Conductive Pens:**

##### **842AR-P - Silver Conductive Pen (high conductivity)**

- Repairing or replacing severely damaged traces on PCB's and mixing boards
- Creating conductive traces in prototype circuits
- Connecting electronic components and through-holes

##### **841AR-P Nickel Conductive Pen (good conductivity)**

- Repairing damaged traces on PCB's.
- Creating short conductive traces in prototype circuits
- Creating bridges
- Increasing the surface area of contacts by painting

##### **838AR-P Carbon Conductive Pen (modest conductivity)**

- Repairing damaged traces on keyboards, game controllers, or remote controls
- Connecting jumpers
- Drawing resistors in prototype circuits

## Conductive Pens Comparison Chart

Uncured Working Properties		838AR-P	841AR-P	842AR-P
Conductive Filler		C (carbon)	Ni (nickel)	Ag (silver)
Color		Black	Dark grey	Metallic silver
Solids Percentage		15%	57%	61%
Density @25 °C [77 °F]		0.84 g/mL	1.51 g/mL	1.7 g/mL
Viscosity @25 °C [77 °F]		319 cP [368 mm <sup>2</sup> /s]	161 cP [106 mm <sup>2</sup> /s]	873 cP [503 mm <sup>2</sup> /s]
VOC Content		43% [370 g/L]	14% [236 g/L]	12% [200 g/L]
Shelf Life		2 y	2 y	2 y
Coverage & Application Properties				
Handling Time		10 min	10 min	10 min
Drying Time @22 °C [72 °F]		24 h	24 h	24 h
Drying Time @65 °C [149 °F]		30 min	30 min	30 min
Theoretical Pen Coverage <sup>a)</sup>		≤71 cm <sup>2</sup>	≤225 cm <sup>2</sup>	≤450 cm
Cured Properties		838AR-P	841AR-P	842AR-P
Electrical Properties				
Volume Resistivity		0.46 Ω·cm	0.0068 Ω·cm	0.0001 Ω·cm
Surface Resistance @ 1 coat		170 Ω/sq	0.52 Ω/sq	<0.01 Ω/sq <sup>b)</sup>
Surface Resistance @ 2 coats		60 Ω/sq	0.38 Ω/sq	<0.01 Ω/sq <sup>b)</sup>
Thermal Properties				
Constant Service Temperature		-40 to 120 °C [-40 to 248 °F]	-40 to 120 °C [-40 to 248 °F]	-40 to 120 °C [-40 to 248 °F]
Intermittent Temperature Limits		-50 to 125 °C [-58 to 257 °F]	-50 to 125 °C [-58 to 257 °F]	-50 to 125 °C [-58 to 257 °F]
Mechanical Properties				
Adhesion, ABS		5B	5B	5B
Pencil Hardness, ABS		H, hard	3H, hard	3H, hard
Magnetic Properties				
Magnetic Class		Diamagnetic (non-magnetic)	Ferromagnetic (magnetic)	Diamagnetic (non-magnetic)
Relative Permeability		<1.0	≥100	<1.0

a) Idealized estimate based on a coat thickness of 25-50 µm [1-2 mil] and a 100% transfer efficiency.

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

## Available Packaging



838AR-P 5 mL Pen

841AR-P 5 mL Pen

842AR-P 5 mL Pen