

# EI-615 Ink

## SILVER CONDUCTIVE INK

### Product Description

EI-615 ink is formulated for aerosol printing and for applications that require high conductivity and low curing temperatures. The ultrasonic ink is capable of fine line <20  $\mu\text{m}$  printed features. The low curing of 120  $^{\circ}\text{C}$  makes the EI-615 ink suitable for flexible substrates such as PET, polyimide and dielectric materials.

### Product Highlights

- Designed for aerosol printing. Compatible with Optomec and IDS Nanojet ultrasonic system
- Optimized for 120  $^{\circ}\text{C}$  curing temperature
- Low resistivity ( $\sim 6\mu\text{ohm-cm}$  @ 120  $^{\circ}\text{C}$ )
- Adhesion to dielectric material (NEA121 was tested)

### Ink Processing

#### Handling

- Store refrigerated at -18 $^{\circ}\text{C}$
- Print and cure in a well-ventilated area
- Recommend not to return product to original container, due to possible contamination during use.

#### Curing

- 120  $^{\circ}\text{C}$  for 60 minutes in a convection oven

Table 1-Typical Ink Physical Properties

Properties	Values
Color	Dark Liquid
Viscosity	1.1 cP
Silver Content	14-15 wt%
Shelf Life	3 months at -18 $^{\circ}\text{C}$
Resistivity	5.6 $\mu\text{ohm-cm}$ at 120 $^{\circ}\text{C}$
Curing Temp	120 $^{\circ}\text{C}$
Curing Time	60 minutes

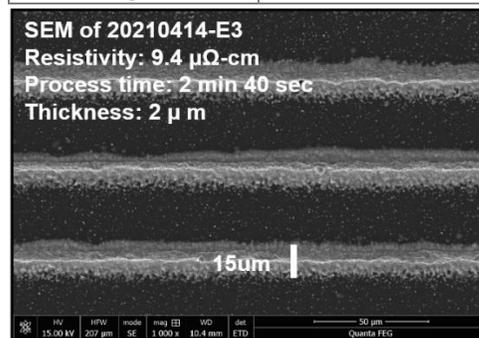


Figure 1: SEM image of <20  $\mu\text{m}$  wide lines

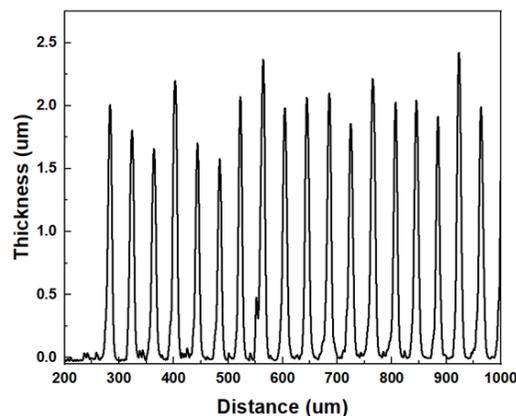


Figure 2: Profile of line and space

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Table 1: Recommended Fine line width Parameters and Expected performance

Parameter	Units	Conditions
Equipment	-	Optomec AJ200
Print Pattern	-	40um pitch test
Layers	-	3
Ink	-	EI-615
Substrate	-	PET
Print Speed	mm/s	3
Sheath	sccm	38
Ultrasonic Atomizer	sccm	18
Tubing		Swagelok PFA-T2-030-100
Atomizer Chiller Temp.	°C	30
Current	mA	620
Nozzle Diameter	um	100
Platen Temperature	°C	23
Print Time	minutes	3
Final Oven Cure	°C	120 C/60 min
Line Width	um	<15
Final Ink Thickness	um	2.5
Cross Section Area	um <sup>2</sup>	18
Tape Test	Scotch Tape	--
Resistance per length	Ohm/mm	5.28
Dry Output	mm <sup>3</sup> /s	2.40 e-5
Resistivity	uOhm-cm	9.4
Resistivity	X	6
Conductivity % Silver	%	17

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