Metalon® SPI-529 Conductive Silver Spray Ink

Product Description

SPI-529 is a water-based, silver nanoparticle spray ink which was originally designed for liquid crystal polymers (LCPs). On a wide range of plastics, SPI-529 will produce cured features with high electrical conductivity and excellent adhesion. It has also been specifically formulated to produce cured films with good scratch and abrasion resistance. SPI-529 can be used in electronics packaging technology, EMI / RFI shielding, and as a seed layer for electroplating various metals.

Key Benefits

- Excellent flow properties and spray coverage
- High electrical conductivity at low cured film thicknesses
- Good adhesion on liquid crystal polymers (LCPs), polyester, polyimide, polycarbonate, and treated polyolefins (e.g. polypropylene)
- Used as a seed layer for metal electroplating
- Easy clean up with particle-free detergent and water

Typical Ink Properties

Silver content (wt. %)	50 (± 2)
Density (wet)	1.8 - 2.0 g / mL
Viscosity	40 - 70 cP
pH	5.70 to 5.95
Shelf life with refrigeration	> 8 months (may need pH adjustment)

Thermal Processing Conditions and Properties of printed films on selected substrates[1]

	Melinex ST505, a type of treated PET			
Cure temperature (˚C)	80	100	120	140
Cure time[2] (min)	≥ 30	≥ 15	≥ 15	≥ 5
Weight resistivity[3] (gΩ / m²)	0.52 (3.1x bulk Ag)	0.40 (2.4x bulk Ag)	0.39 (2.3x bulk Ag)	0.39 (2.3x bulk Ag)
Volume resistivity[4] (μΩ cm)	12 (7.4x bulk Ag)	9.1 (5.7x bulk Ag)	8.5 (5.3x bulk Ag)	7.9 (5.0x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	4.6	3.6	3.3	3.1

	Polycarbonate		
Cure temperature (˚C)	80	100	120
Cure time[2] (min)	≥ 30	≥ 15	≥ 15
Weight resistivity[3] (gΩ / m²)	0.50 (3.0x bulk Ag)	0.44 (2.6x bulk Ag)	0.43 (2.6x bulk Ag)
Volume resistivity[4] (μΩ cm)	10 (6.4x bulk Ag)	9.2 (5.8x bulk Ag)	8.4 (5.3x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	4.0	3.6	3.3

Metalon® Conductive Inks for Printed Electronics

www.novacentrix.com

Metalon® SPI-529 Conductive Silver Spray Ink

	Polypropylene (stress-relieved)		
Cure temperature (˚C)	80	100	120
Cure time[2] (min)	≥ 30	≥ 15	≥ 15
Weight resistivity[3] (gΩ / m²)	0.51 (3.1x bulk Ag)	0.48 (2.9x bulk Ag)	0.45 (2.7x bulk Ag)
Volume resistivity[4] (μΩ cm)	10 (6.4x bulk Ag)	9.2 (5.8x bulk Ag)	8.5 (5.3x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	4.0	3.6	3.3

	Kapton HN, a type of polyimide			
Cure temperature (˚C)	140	200	250	275
Cure time[2] (min)	≥ 15	≥ 5	≥ 5	≥ 5
Weight resistivity[3] (gΩ / m²)	0.36 (2.2x bulk Ag)	0.35 (2.1x bulk Ag)	0.30 (1.8x bulk Ag)	0.27 (1.6x bulk Ag)
Volume resistivity[4] (μΩ cm)	8.0 (5.0x bulk Ag)	7.5 (4.7x bulk Ag)	5.8 (3.7x bulk Ag)	5.4 (3.4x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	3.1	2.9	2.3	2.1

[1]The theoretical wet ink thickness for all prints was 51 μm. All prints were cured in a convection oven.
[2]Most tabulated cure times (for a given cure temperature) are shown as a range of times. This is indicated by the use of the "≥" sign. In this range of cure times, the tabulated values of weight and volume resistivity, and sheet resistance at 1 mil are the same.
[3]The number in brackets for each entry is the weight resistivity value divided by the weight resistivity of bulk silver (at 20˚C).
[4]The number in brackets for each entry is the volume resistivity value divided by the volume resistivity of bulk silver (at 20˚C).

General Processing Guidelines

- In order to achieve best adhesion for cure temperatures ≥ 200˚C, a two-step heating procedure is recommended. The first cure step should be at a lower temperature, for example 140˚C. The second cure step will be at the target cure temperature.

For more information about this ink, please contact us at info@novacentrix.com