

Metalon® PSI-211 Conductive Screen Ink

Product Description

PSI-211 is an aqueous screen-printable conductive ink which contains proprietary silver nanoparticles. It has been specifically formulated to produce high conductivity in cured films of low thickness. This allows equivalent sheet resistance values with less material usage as compared to conventional polymer thick film conductive inks. PSI-211 can be printed on a variety of substrates which include treated polyester, polyimide, glass, polycarbonate, coated papers, and card stock.

Key Benefits

- Fast curing at low temperatures suitable for reel-to-reel processing
- High conductivity at low cured film thicknesses for material cost savings
- Good printability (< 100 μm features) with low surface roughness
- Good adhesion, flexibility, and crease resistance on select treated PET films
- Good adhesion to polyimide, glass, and polycarbonate
- Minimal VOCs

Typical Formulation Properties

Solids content (wt. %)	42 (± 2)
Density (wet)	1.6 g / mL (13.4 lb / gal)
Viscosity at 10s ⁻¹ / 100s ⁻¹	3500 - 6000 cP / 1500 - 3000 cP
pH	5.80 ± 0.05
Shelf life with refrigeration	> 6 months (may need pH adjustment)

Thermal Processing Conditions and Properties of printed films on selected substrates¹

	Melinex ST505, a type of treated polyester (PET)		
Cure temperature (°C)	80	100	140
Cure time ² (min)	≥ 15	≥ 5	≥ 5
Weight resistivity ³ (gΩ / m ²)	0.52 (3.1x bulk Ag)	0.51 (3.1x bulk Ag)	0.46 (2.8x bulk Ag)
Volume resistivity ⁴ (μΩ cm)	10 (6.5x bulk Ag)	8.0 (5.0x bulk Ag)	7.0 (4.4x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	4.1	3.2	2.8
Cross-cut tape test (ASTM 3359 method B)	5B	5B	5B

	Kapton HN, a type of polyimide			
Cure temperature (°C)	140	200	250	275
Cure time ² (min)	≥ 5	≥ 5	≥ 5	≥ 5
Weight resistivity ³ (gΩ / m ²)	0.44 (2.6x bulk Ag)	0.43 (2.6x bulk Ag)	0.31 (1.8x bulk Ag)	0.27 (1.6x bulk Ag)
Volume resistivity ⁴ (μΩ cm)	7.0 (4.4x bulk Ag)	6.3 (4.0x bulk Ag)	4.6 (2.9x bulk Ag)	4.2 (2.7x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	2.8	2.5	1.8	1.7
Cross-cut tape test (ASTM 3359 method B)	5B	5B	5B	0B



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	Glass			
Cure temperature (°C)	100	140	200	250
Cure time ² (min)	≥ 30	≥ 5	≥ 5	≥ 5
Weight resistivity ³ (gΩ / m ²)	0.60 (3.6x bulk Ag)	0.54 (3.2x bulk Ag)	0.47 (2.8x bulk Ag)	0.42 (2.5x bulk Ag)
Volume resistivity ⁴ (μΩ cm)	9.0 (5.7x bulk Ag)	7.6 (4.8x bulk Ag)	7.0 (4.4x bulk Ag)	6.1 (3.8x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	3.5	3.0	2.8	2.4
Cross-cut tape test (ASTM 3359 method B)	5B	5B	5B	0B

¹The theoretical wet ink thickness for all prints was 51 μm. All prints were cured in a convection oven.

²All 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, sheet resistance at 1 mil, and cross-cut tape test result are the same.

²The number in brackets for each entry is the weight resistivity value divided by the weight resistivity of bulk silver (at 20°C).

³The number in brackets for each entry is the volume resistivity value divided by the volume resistivity of bulk silver (at 20°C).

General Processing and Clean-up Guidelines

- Printing Equipment: reel-to-reel, manual
- Local Relative Humidity: > 50 %
- Screen Types:
 - stainless steel and polyester
 - water-compatible emulsion
- Clean-up Solution: 1:10 particle-free, dish detergent : water (by volume)

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