Metalon® PSI-219 Conductive Screen Ink

Product Description

PSI-219 is an aqueous screen-printable conductive ink which contains proprietary silver nanoparticles. It has been specifically formulated to provide both excellent adhesion on a diverse range of substrates and high conductivity in the cured films. PSI-219 can be printed on 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
- Excellent adhesion, flexibility, and crease resistance on select treated PET films
- Excellent 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 substrates[1]

	Melinex ST505, a type of treated polyester (PET)			
Cure temperature (˚C)	60	80	100	140
Cure time[2] (min)	60	≥ 15	≥ 5	≥ 5
Weight resistivity[3] (gΩ / m^2)	1.09 (6.5x bulk Ag)	0.71 (4.2x bulk Ag)	0.63 (3.8x bulk Ag)	0.52 (3.1x bulk Ag)
Volume resistivity[4] (μΩ cm)	22 (14x bulk Ag)	14 (8.5x bulk Ag)	10 (6.3x bulk Ag)	7.4 (4.6x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	8.5	5.3	3.9	2.9
Cross-cut tape test (ASTM 3359 method B)	5B	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)	0.39 (2.4x bulk Ag)	0.39 (2.4x bulk Ag)	0.36 (2.1x bulk Ag)	0.28 (1.7x bulk Ag)
Volume resistivity[4] (μΩ cm)	7.7 (4.9x bulk Ag)	7.4 (4.6x bulk Ag)	6.3 (4.0x bulk Ag)	4.9 (3.1x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	3.0	2.9	2.5	1.9
Cross-cut tape test (ASTM 3359 method B)	5B	5B	5B	5B

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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)	0.62 (3.7x bulk Ag)	0.55 (3.3x bulk Ag)	0.52 (3.1x bulk Ag)	0.48 (2.9x bulk Ag)
Volume resistivity[4] (μΩ cm)	11 (6.8x bulk Ag)	8.4 (5.3x bulk Ag)	7.8 (4.9x bulk Ag)	6.5 (4.1x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	4.3	3.3	3.1	2.5
Cross-cut tape test (ASTM 3359 method B)	5B	5B	5B	5B

	Glass
Cure temperature (˚C)	275
Cure time[2] (min)	≥ 5
Weight resistivity[3] (gΩ / m^2)	0.36 (2.2x bulk Ag)
Volume resistivity[4] (μΩ cm)	5.8 (3.6x bulk Ag)
Sheet resistance at 1 mil (mΩ / square)	2.3
Cross-cut tape test (ASTM 3359 method B)	5B

[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, sheet resistance at 1 mil, and cross-cut tape test result are the same.
[2]The number in brackets for each entry is the weight resistivity value divided by the weight resistivity of bulk silver (at 20˚C).
[3]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 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)

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