# Metalon® SPI-508 Conductive Silver Spray Ink

## Product Description

SPI-508 is a water-based, silver nanoparticle spray ink which is designed to produce cured features with high conductivity on a wide range of substrates. It has also been specifically formulated to produce cured films with good scratch and abrasion resistance as well as good adhesion to most plastic surfaces. SPI-508 can be used in EMI / RFI shielding, as a seed layer for electroplating various metals, and may be incorporated into the design of filters and membranes for wastewater treatment.

## Key Benefits

- Excellent flow properties and spray coverage
- High electrical conductivity at low cured film thicknesses
- Good adhesion on treated polyester, polyimide, and polycarbonate
- Good electrical conductivity on different types of paper
- 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)** | 100 | 120 | 140 |
| **Cure time[2] (min)** | ≥ 30 | ≥ 15 | ≥ 5 |
| **Weight resistivity[3] (gΩ / m²)** | 0.46 (2.8x bulk Ag) | 0.41 (2.5x bulk Ag) | 0.40 (2.4x bulk Ag) |
| **Volume resistivity[4] (μΩ cm)** | 9.4 (5.9x bulk Ag) | 8.0 (5.0x bulk Ag) | 7.6 (4.8x bulk Ag) |
| **Sheet resistance at 1 mil (mΩ / square)** | 3.7 | 3.2 | 3.0 |

| | Verso Reflections paper [60 lb] | | | |
|---|---|---|---|---|
| **Cure temperature (˚C)** | 100 | 120 | 140 | 175 |
| **Cure time[2] (min)** | 120 | ≥ 60 | ≥ 30 | 15 |
| **Weight resistivity[3] (gΩ / m²)** | 0.79 (4.8x bulk Ag) | 0.42 (2.5x bulk Ag) | 0.36 (2.2x bulk Ag) | 0.31 (1.8x bulk Ag) |
| **Volume resistivity[4] (μΩ cm)** | 17 (11x bulk Ag) | 8.7 (5.5x bulk Ag) | 7.2 (4.5x bulk Ag) | 5.9 (3.7x bulk Ag) |
| **Sheet resistance at 1 mil (mΩ / square)** | 6.7 | 3.4 | 2.8 | 2.3 |

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# Metalon® Conductive Inks for Printed Electronics

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| | Kapton HN, a type of polyimide | | | |
|---|---|---|---|---|
| **Cure temperature (˚C)** | 140 | 175 | 200 | 250 |
| **Cure time[2] (min)** | ≥ 15 | ≥ 5 | ≥ 5 | ≥ 5 |
| **Weight resistivity[3] (gΩ / m²)** | 0.39 (2.4x bulk Ag) | 0.37 (2.2x bulk Ag) | 0.36 (2.2x bulk Ag) | 0.35 (2.1x bulk Ag) |
| **Volume resistivity[4] (μΩ cm)** | 8.0 (5.0x bulk Ag) | 7.4 (4.6x bulk Ag) | 7.2 (4.5x bulk Ag) | 6.6 (4.2x bulk Ag) |
| **Sheet resistance at 1 mil (mΩ / square)** | 3.1 | 2.9 | 2.8 | 2.6 |

| | Kapton HN |
|---|---|
| **Cure temperature (˚C)** | 275 |
| **Cure time[2] (min)** | ≥ 5 |
| **Weight resistivity[3] (gΩ / m²)** | 0.30 (1.8x bulk Ag) |
| **Volume resistivity[4] (μΩ cm)** | 5.7 (3.6x bulk Ag) |
| **Sheet resistance at 1 mil (mΩ / square)** | 2.2 |

[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**