

FS0142

High Resolution Printable Semi-Sinterable Silver Conductor

Product Description

ACI FS0142 is a hybrid or semi-sintering silver-based conductor supplied at high viscosity/solids enabling high resolution printed circuitry for flexible hybrid electronic devices on flexible or rigid substrates. ACI's Alchemy Conductive Inks offer the ease of use and processing of polymer thick film silvers, and the superior conductivity of nanoparticle based sintering inks. The FS0142 series offers even lower volume resistivity than the FS0117 series. After curing, reflow soldering can be used for component attach using some low temperature solder pastes and/or by using specific substrates available from ACI. FS0142 should be compatible with most dielectric/insulator inks and solder mask materials.

Product Benefits

- Reduced silver usage enables cost savings
- Enable SMD attach using low temperature solder pastes and substrates (PET)
- Enable higher power and current density applications
- Sinters well at greater film thickness than nano inks, enabling both low volume resistivity and low sheet resistance
- Superior mechanical performance (flex and crease ability)
- Allow high resolution printing without compromising conductivity/resistance
- Higher speed curing than nanoinks
- Superior performance when processed at similar conditions used for traditional polymer thick film inks

Typical Performance

| | |
|--|---|
| Volume resistivity 150°C for 15 min in box oven | <0.002 Ω/square/mil <6.0 x 10 ⁻⁶ Ω·cm |
| Adhesion ¹ | 5B |
| U-flex and crease ability | Contact ACI for data related to your application |

¹ Method based on ASTM D3359 Method B tested on 0.005" Melinex® ST506 PET

Typical Properties as Supplied

| | |
|-----------------------------|-----------|
| Physical State | Paste |
| Color | Silver |
| Viscosity ² | 15 Pa·s |
| Density | 3.72 g/mL |
| Percent Solids ³ | 81% |
| Shelf Life at 20°C | 12 Months |

Typical Processing Parameters

| | | | |
|--|--|------------------------|------------------------|
| Deposition methods | Screen printing or syringe microdispense | | |
| Ideal Curing Time and Temperatures | 5-15 min in box oven at 150°C ≤5 min in industrial conveyor oven at 150°C, ≤3 min with IR | | |
| Recommended Screen Meshes Mesh counts are in threads per inch (TPI) | 420/20 μm V-Screen Next 11-18 μm thread stainless steel & tungsten meshes | | |
| Emulsion Over Mesh (EOM) Thickness | 6 μm or minimum recommended for mesh | | |
| Theoretical Dry Film Thickness for Recommended Meshes w and w/o EOM ⁴ | 380/34 μm PET | ~7 μm | ~5 μm |
| | 460/27 μm PET | ~7 μm | ~5 μm |
| | 420/20 μm VSN | ~10 μm | ~7 μm |
| Coverage for Recommended meshes w and w/o EOM ⁴ | 380/34 μm PET | ~15 m ² /kg | ~22 m ² /kg |
| | 460/27 μm PET | ~16 m ² /kg | ~25 m ² /kg |
| | 420/20 μm VSN | ~11 m ² /kg | ~15 m ² /kg |
| Mixing | Slow thorough mix, avoid inducing bubbles, fixed spatula in rotating jar ideal ⁵ | | |
| Thinner/Diluent | RD0135 | | |
| Storage | In sealed container in cool dry location | | |
| Clean Up Solvents | Acetone, MEK, and similar solvents | | |

² Measured on Anton Paar MCR302 at 10⁻¹ sec shear rate at 25°C after preshearing at 100⁻¹ sec for 5 min

³ 150°C for 120 minutes in box oven

⁴ Estimates relevant for finer and coarser feature printing respectively

⁵ AT-LM4 Stirring Type Mixer (E211) recommended



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Caution

Proper industrial safety precautions should be exercised in using these products. Use with adequate ventilation. Avoid prolonged contact with skin or inhalation of any vapors emitted during use or heating of these compositions. The use of safety eye goggles, gloves or hand protection creams is recommended. Wash hands or skin thoroughly with soap and water after using these products. Do not eat or smoke in areas where these materials are used. Refer to appropriate MSDS sheet.

Disclaimer

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