Celanese
The chemistry inside innovation™

Micromax™ MT125

Electronic Inks and Pastes

Silver Conductor

Silver conductor Micromax™ MT125 is used to fabricate low-voltage circuitry, especially on flexible substrates. It can be used with manual, semi-automatic and reel-to-reel equipment.

Product information

Solvent or thinner	Micromax™ 8210	
Solid content	60.3 - 61.7	%
Maximum Service Temperature	90[1]	°C

[1]: on 125 µm Polyester Film

Rheological properties

Viscosity	20 - 30[2]	Pa.s

[2]: Brookfield RVT, UC&SP, SC4-14/6R, 5 rpm, 25°C ± 0.2°C

Application technique

Mask mesh	325[3]	
Drying time	5 - 6[4]	min
Drying temperature	120[4]	°C
Theoretical coverage	120 - 230[5]	cm^2/g
Recommended film thickness, dried	12 - 15[6]	µm

[3]: Screen Types: Stainless steel

[4]: box oven

[5]: dependent on screen mesh size & type

[6]: 325-mesh stainless steel screen

Typical mechanical properties

Adhesion, pull tape	no material transfer[7]	class

[7]: 3M Scotch Tape #600, on 125 µm Polyester Film

Electrical properties

Surface resistivity	8 - 15[8]	mOhm per square

[8]: at 25µm

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Storage and stability

Shelf life	3[9] months

[9]: in unopened containers, from date of shipment, at temperature <25 °C (>0 °C)

Additional information

How to use

Design & compatibility

- Compatibility
  - Whilst Micromax™ has tested this composition with specified materials and under the recommended processing conditions, it is impossible or impractical to cover every combination of materials, customer processing conditions and circuit layout. It is therefore essential that customers thoroughly evaluate this material in their specific situations, in order to completely satisfy themselves as to the overall quality and suitability of the composition for its intended application(s).

Processing

- Substrates
  - Polyester, polyimide, paper, epoxy-glass
- Screen types
  - Polyester, stainless steel (SS)
- Printing
  - Reel-to-reel, semi-automatic, manual
  - Conductor Composition Micromax™ MT125 should be thoroughly mixed before use. This is best achieved by slow, gentle hand stirring with a clean, burr-free spatula (flexible plastic or stainless steel) for 1-2 minutes.
  - Printing should be carried out in a clean, well-ventilated area.
  - Note : Optimum printing characteristics of Micromax™ MT125 are generally achieved in the temperature range 20 °C - 23 °C. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing.
- Typical circuit line thickness
  - 12 - 15 µm
  - Printed with 325-mesh SS screen
- Work life
  - > 2 hours
- Thinning
  - Micromax™ MT125 is optimised for screen printing and thinning is not normally required. Micromax™ Electronics Composition

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Thinner 8210 may be used sparingly for slight adjustments to viscosity or to replace evaporation losses. However, the use of too much thinner or the use of a non-recommended thinner may affect the rheological behaviour of the material and its printing characteristics.

- Clean-up solvents
  - Ethylene diacetate or Methyl propasol acetate
- Dryiing
  - Box oven : 120°C for 5-6 mins
  - Reel-to-reel : 140°C for 1 min.

Properties

Typical Physical Properties on 125µm Polyester Film

Test	Properties
Resistivity after Flex (mΩ/sq/25µm) 15sec after test Crease 180°, 1 cycle	≤ 50
Abrasion Resistance, Pencil Hardness (ASTM D3363-74) [H]	≥ 1
Soldering	Not Recommended
Change in Physical Properties after Environmental Tests*	Insignificant
Change in Electrical Properties after Environmental Tests*	≤ 10 %

*Environmental Test
A. Thermal Shock (+85°C to -40°C, 30 min each, 5cycle)
B. Dry Heat (+85°C, 10 days)
C.Humidity (+40°C, 95% RH, 10 days) [MIL Std 202E, method 103, cond. A]
D. Salt Spray (+35°C, 5% salt, 10 days) [ASTM B117]
E. Silver Migration (1 V DC/mil gap, +40°C, 90% RH, 500hr, tested on 40 and 7mil gaps)
F. Sulphur Dioxide (+45°C, 90% RH, 400hr, in a 9-liter chamber containing 500 mg of flowers of sulphur)

General

Performance will depend to a large degree on care exercised in screen printing. Scrupulous care should be taken to keep the composition, printing screens and other tools free of metal contamination. Dust, lint and other particulate matter may also contribute to poor yields.

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Storage and shelf life

Storage : Containers of Micromax™ MT125 may be stored in a clean, stable environment at room temperature (<25°C), with their lids tightly sealed. Storage in freezers (temperature <0°C) is NOT recommended, as this could cause irreversible changes in the material. Jar rolling is unnecessary and is NOT recommended, as this could change the rheology of the material.
Shelf life : Conductor Composition Micromax™ MT125 has a shelf life of 6 months from date of shipment, for factory-sealed (unopened) containers, stored under room temperature conditions.

Safety and handling

For safety and handling information pertaining to this product, read Safety Data Sheet (SDS).

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