

Micromax™ ME614

Electronic Inks and Pastes

Silver Conductor

Micromax™ ME614 is part of the Micromax™ suite of materials developed for In Mold Electronic applications. Micromax™ ME614 is a stretchable silver conductor capable of withstanding thermoforming and over-molding conditions and suitable for laser ablation. This composition can be used where very fine line/space structures or good edge sharpness are needed for capacitive touch applications and interconnecting circuitry, enabling fully integrated, 3-dimensional functional electronic devices.

Product benefits

- Fine structures by laser ablation down to 30µm Lines/spaces
- Higher conductivity silver for In Mold Electronics
- Excellent adhesion directly on polycarbonate and graphic inks
- Excellent performance after thermoforming and injection molding
- Compatible with Cnalu CNB™ transparent conductive film
- Compatible with Chasm AgeNT™ transparent conductive films

Product information

Solvent or thinner	Micromax™ 3610
Solid content	70 - 73 ^[1] %
[1]: 150°C	

Rheological properties

Viscosity	20 - 40 ^[2] Pa.s
[2]: Brookfield RVT, #14 spindle, 10 rpm, 25°C	

Application technique

Mask mesh	230 - 325 ^[3]
Drying time	20 ^[4] min
Drying temperature	120 ^[4] °C
Theoretical coverage	200 ^[5] cm²/g
Recommended film thickness, dried	8 - 12 ^[6] µm
[3]: Screen Types: Stainless steel	
[4]: box oven	
[5]: using screen type 325 mesh polyester	
[6]: 280 mesh stainless steel	

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Typical mechanical properties

Adhesion, cross hatch
[7]: ASTM D3359-78

5B^[7] class

Electrical properties

Surface resistivity
[8]: at 25.4µm

≤40^[8] mOhm per square

Storage and stability

Shelf life
[9]: in unopened containers, from date of shipment, at temperature <25 °C

6^[9] months

Additional information

How to use



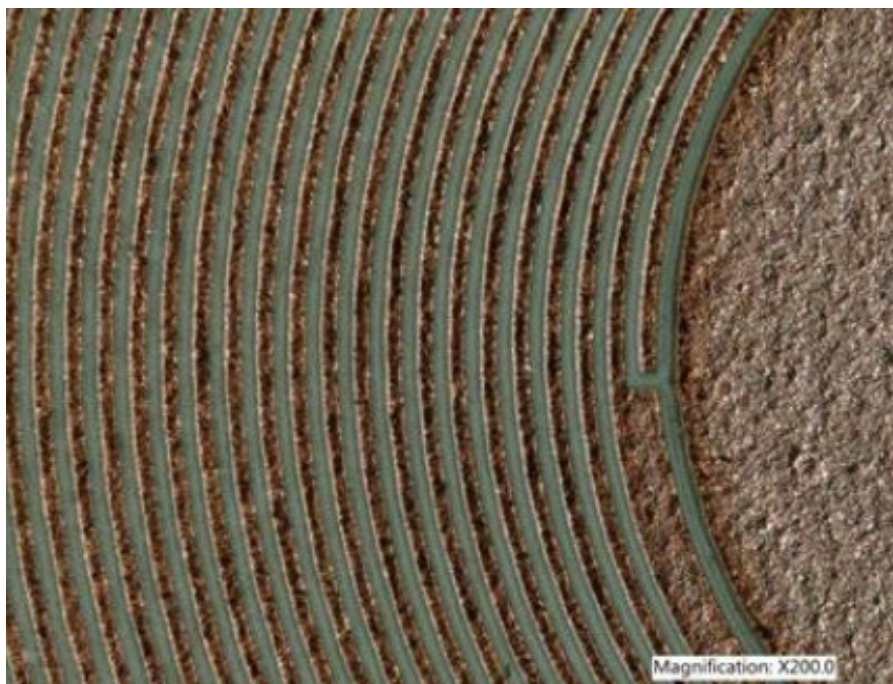
Processing

- **Substrates**
 - Polycarbonate
- **Screen types**
 - Stainless steel mesh - 325-230 wire/inch (SD 50/30-SD 75/36)
 - Polyester mesh - 90-40 to 61-64 thread/cm
- **Printing**
 - Reel-to-reel, semi-automatic or manual
- **Typical circuit line thickness**
 - 8 - 12 µm

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- Printed with SD 56/36 (280mesh) stainless steel or 77-48 PET Screen
- **Work life**
 - > 1 hour
- **Clean-up solvent**
 - Ethylene glycol diacetate
- **Drying**
 - Box oven : 120°C for 20 minutes
 - Reel-to-reel : 120°C for 4 minutes
 - Drying is a critical processing step and in order to achieve optimum performance, sufficient temperature/time should be allowed to ensure complete removal of solvent.
 - Dry in a well-ventilated box oven or belt/conveyor furnace. Air flow and extraction rates should be optimized to ensure complete removal of solvent from the paste. A strong air flow may help to reduce the drying temperature combination. It will also aid in achieving the lowest as-printed resistance.
- **Laser ablation**
 - Micromax™ ME614 may be used for high precision laser ablation to achieve very fine line/space structures or good edge sharpness.
 - Laser ablation structures down to 30µm line/space with LPKF short-pulse-laser technology.
 - Sample below achieved with LPKF ProtoLaser R4.



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• Thermoforming

- Thermoforming performance of Micromax™ ME614 can vary depending on the build structure, processing conditions, thermoforming technique, and equipment used. As such, parameters need to be assessed and optimized.
- If more precision is needed with printed symbols and structures, high pressure forming has shown to give more accuracy as it ensures more even stretch. Forming temperatures around 160°C can be used. Stretchability >50% can be achieved.

Properties

Typical Physical Properties

Test	Properties
Maximum Stretch Capability (1 mm trace) (%)	~ 60
Abrasion Resistance, Pencil Hardness (ASTM D3363-74) [H]	≥ 1

Information in this datasheet shows anticipated typical physical properties for Micromax™ ME614 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Storage and shelf life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature (<25°C). Shelf life of material in unopened containers is six months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Safety and handling

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