

Micromax™ ME102

Electronic Inks and Pastes

Silver Conductor

Micromax™ ME102 is part of the Micromax™ suite of materials developed for In Mold Electronic applications. Micromax™ ME102 is a high conductivity silver ink capable of withstanding mild thermoforming.

This composition is ideal for antenna and feater applications, as well as interconnecting circuitry, enabling fully integrated 3-dimensional functional electronic devices.

Product benefits

- High conductivity silver composition for In Mold Electronics
- Excellent adhesion directly on Polycarbonate
- Excellent performance after thermoforming and injection molding
- Excellent RFID – Antenna performance
- Compatible with Canatu CNB™ transparent conductive film

Product information

Solvent or thinner	Micromax™ 3610
Solid content	70.4 - 77.5 ^[1] %
[1]: 150 °C	

Rheological properties

Viscosity	30 - 50 ^[2] Pa.s
[2]: Brookfield RVT, #14 spindle, 10 rpm, 25 °C	

Application technique

Drying time	20 ^[3] min
Drying temperature	120 ^[3] °C
Theoretical coverage	150 ^[4] cm ² /g
Recommended film thickness, dried	5 - 10 µm
[3]: box oven	
[4]: at 10µm	

Typical mechanical properties

Adhesion, cross hatch	5B ^[5] class
[5]: ASTM D3359-78	

Electrical properties

Surface resistivity	≤15 ^[6] mOhm per square
[6]: at 25.4µm	

Micromax™ ME102

Electronic Inks and Pastes

Storage and stability

Shelf life

6^[7] months

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

Additional information

How to use

Processing

- **Substrates**
 - Polycarbonate, surface treated polyester
- **Screen types**
 - Polyester, stainless steel
- **Printing**
 - Reel-to-reel, semi-automatic or manual
- **Work life**
 - > 1 hour
- **Clean-up solvent**
 - Ethylene 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.
- **Thermoforming**
 - Thermoforming performance of Micromax™ ME102 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 up to ~30% can be achieved.

Properties

Typical Physical Properties

Test	Properties

Micromax™ ME102

Electronic Inks and Pastes

Maximum Stretch Capability (1mm trace) (%)	~ 30
Abrasion Resistance, Pencil Hardness (ASTM D3363-74) [H]	1

Information in this datasheet shows anticipated typical physical properties for Micromax™ ME102 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).

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.

© 2023 Celanese or its affiliates. All rights reserved. Celanese®, registered C-ball design and all other trademarks identified herein with ®, TM, SM, unless otherwise noted, are trademarks of Celanese or its affiliates. Fortron is a registered trademark of Fortron Industries LLC. KEPITAL is a registered trademark of Korea Engineering Plastics Company, Ltd.