

Micromax™ AS100

Electronic Inks and Pastes

Dielectric

The Micromax™ AS series of thick film pastes is suitable for applications where thermal management is crucial to performance of the circuit. Micromax™ AS100 is a dielectric paste for screen printing of insulating layers directly onto aluminum substrates and heat sinks for construction of high thermally conductivity interfaces for LED lighting and power electronics components.

Product characteristics

- Dense hermetic fired structure enables high breakdown voltages > 2.0 kV at low fired thickness of 50µm
- Low temperature firing process <520°C
- High operating temperatures >220°C
- Patternable, additive process for lower material costs
- Compatible with silver conductor (Micromax™ AS300) and thermal via fill (Micromax™ AS320) pastes
- Compatible with various aluminum substrates

Product information

Solvent or thinner Micromax™ 8250

Rheological properties

Viscosity 50 - 100^[1] Pa.s

[1]: Brookfield 2xHAT, UC&SP, SC-14, 10 rpm, 25°C

Application technique

Mask mesh	200
Mask emulsion	12 µm
Drying time	≥10 min
Drying temperature	150 °C
Theoretical coverage	65 - 75 ^[2] cm ² /g
Recommended film thickness, fired	≥35 ^[3] µm
Shrinkage, fired	33 %
Leveling time	10 min

[2]: Recommended minimum fired thickness > 35µm (with 2 layers)

[3]: tested with 2 layers of dielectric printed with 200 mesh stainless steel/12µm EOM, fired for 7-10 minutes at peak temperature of 510°C with a total time of 75-90 minutes in an air atmosphere.

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Thermal properties

Thermal conductivity 1.6^[4] W/(m K)

[4]: Measured using Thermal Interface Materials (TIM) analysis.

Electrical properties

Breakdown Voltage ≥4000 V

[5]: tested with 4 layers of 70 µm total fired thickness

Storage and stability

Shelf life 3^[6] months

[6]: in unopened containers, from date of shipment, at temperature between 5-30°C

Additional information

How to use

Design & compatibility

- **Compatibility**

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

Processing

- **Substrates**

- Substrates of different compositions and from various manufacturers may result in variations in performance properties. Cleaning of the aluminum substrate surface with an alkali cleanser (e.g. Alconox), rinsing with DI water and drying before printing the first layer is recommended.

- **Screen types**

- 200 mesh stainless steel screen with 12µm emulsion build-up.

- **Printing**

- The composition 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 about 1-2 minutes. Care must be taken to avoid air entrapment. Printing should be performed in a well-ventilated area.
- Note : Optimum printing characteristics are generally achieved in

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the room temperature range of 20°C - 23°C. It is therefore important that the material, in its container, is at the temperature prior to commencement of printing. Class 10,000 printing area is recommended for building complex hybrids and multilayer circuits, otherwise severe yield losses could occur.

- **Thinning**

- Micromax™ AS100 composition is optimized for screen printing and thinning is not normally required. Use the Micromax™ recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use of a non-recommended thinner may affect the rheological behavior of the material and its printing characteristics.

- **Drying**

- Allow prints to level for 10 minutes at room temperature for ≥10 minutes at 150°C.
- Dry in a well-ventilated oven or conveyor dryer.

- **Firing**

- 2-3 minutes over peak temperature in the range 500-520°C with a total time of 45-50 minutes in an air atmosphere.
- Fire in well-ventilated belt, conveyor furnace or static furnace. Air flows and extraction rates should be optimized to ensure that oxidizing conditions exist within the muffle and that no exhaust gases enter the room.

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 materials may also contribute to poor yields.

Storage and shelf life

Containers may be stored in a clean, stable environment at room temperature (between 5°C – 30°C) with their lids tightly sealed. Storage in high temperature (>30°C) or in freezers (temperature <0°C) is NOT recommended as this could cause irreversible changes in the material. The shelf life of compositions in factory-sealed (unopened) containers between (5°C – 30°C) is 3 months from date of shipment.

Safety and handling

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

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