Micromax™ LF151

Electronic Inks and Pastes

Dielectric Composition

Micromax™ LF151 is a filled, crystallizable screen-printed thick film dielectric composition and is an integral element of System LF. It is a versatile dielectric intended for use in both high reliability and low cost MCM (Multi-Chip Module) and hybrid interconnect applications.

Product benefits

- Lead, Cadmium, Chromium and Nickel Free*
- Broad conductor compatibility (gold, silver and mixed metal)
- Compatible with cofirable conductors
- Highly resistant to EMF (electro-motive force) blistering and shorting
- Robust electrical and mechanical properties
- Dense, hermetic microstructure

* Cadmium, chromium, nickel and lead 'free' as used herein means that these are not intentional ingredients in and are not intentionally added to the referenced product. Trace amount however may be present.

Product information

Solvent or thinner	Micromax™ 4553

Rheological properties

Viscosity	70 - 110[1]	Pa.s

[1]: Brookfield HBT, UC&SP, 50 rpm, 25 °C

Application technique

Mask mesh	230 - 280	
Drying time	10 - 15	min
Drying temperature	150	°C
Theoretical coverage	110 - 130[2]	cm^2/g
Recommended film thickness, fired	≥30	µm
Via, diameter resolution	250 - 300	µm
Leveling time	10 - 15	min

[2]: based on average fired thickness of 14µm

[3]: total fired thickness

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Electrical properties

Dielectric Constant	8 - 10[4]	
Dissipation Factor	≤0.5[4]	%
Insulation Resistance, DC	≥1E12[5]	Ohm
Surface Leakage Current	≤1[6]	µA/cm²
Breakdown Voltage	≥1600[7]	V

[4]: at 1 MHZ

[5]: at 100 VDC, 30µm

[6]: Standard measurements made after 5 minutes at 10 VDC

[7]: kV at 30µm

Storage and stability

Shelf life	6[8]	months

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

Additional information

How to use

Design & compatibility

- Design
  - The fired thickness of the dielectric layer should be at least 30mm between the conducting layers this can be achieved with 2 prints of the dielectric. Each printed dielectric layer should be separately fired. Co-firing is not recommended.

Processing

- Substrates
  - Substrates of different compositions and from various manufacturers may result in variation in performance properties.
- Printing
  - 230 to 280 stainless steel screen, at a print speed of 15 cm/sec.
  - The composition should be thoroughly mixed before use. This is best achieved by slow, gently, hand stirring with a clean burr-free spatula (flexible plastic) for 1-2 minutes. Care must be taken to avoid air entrapment. Printing should be performed in a clean and well-ventilated area.
  - Note : Optimum printing characteristics are generally achieved in the room temperature range of 20°C - 23°C. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing.
- Thinning
  - This composition is optimized for screen-printing. 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 10-15 minutes at room temperature, and then dry for 10-15 minutes at 150°C.
  - Dry in a well-ventilated oven or conveyor dryer.
- Firing
  - 850°C peak held for 10 minutes on 30 minutes cycle in an air atmosphere.
  - Fire in a well ventilated belt, conveyor furnace, or static furnace. Airflows and extraction rates should be optimizes to ensure that oxidizing conditions exist within the muffle.

Properties

- Information in this datasheet shows anticipated typical physical properties for Micromax™ LF151 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).