Micromax™ QM44D

Electronic Inks and Pastes

Dielectric Composition

Micromax™ QM44D is a filled, crystalizable screen printed thick film dielectric composition and is an integral element of the Micromax™ QM44 multilayer system. It is a versatile dielectric intended for use in both high reliability and low cost Micromax™ and hybrid interconnect applications.

Product characteristics

- Broad conductor compatibility (Gold, silver and mixed metal)
- Compatible with cofirable conductors
- Highly resistant to EMF blistering and shorting
- Robust electrical and mechanical properties
- Dense, hermatic microstructure

Product information

Solvent or thinner	Micromax™ 4553

Rheological properties

Viscosity	80 - 120[1]	Pa.s

[1]: Brookfield HBT, UC&SP, SC4-14/6R, 50 rpm, 25 °C ± 0.2 °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
Leveling time	10 - 15	min

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

[3]: total fired thickness

Electrical properties

Dielectric Constant	8 - 10[4]	
Dissipation Factor	≤0.5[4]	%
Insulation Resistance, DC	≥1E12	Ohm
Surface Leakage Current	≤1[6]	$\mu A/cm^2$
Breakdown Voltage	≥1600	V

[4]: at 1 MHZ

[5]: 100 VDC, 30µm

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

[7]: at 30µm

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Storage and stability

Shelf life	6[8] months

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

Additional information

How to use

Design & compatibility

- Design
  - The fired thickness of the dielectric layer should be at least 30µm 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.
- Compatibility
  - Whilst Micromax™ has tested this composition with 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 overall 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.
- Printing
  - 230 to 280 stainless steel screen, at a print speed of 15cm/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 or stainless steel) 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.
  - Class 10,000 printing area is recommended for building complex hybrids and multilayer circuits, otherwise severe yield losses could occur.
- Thinning
  - This composition is optimized for screen printing, thinning is not

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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 behaviour of the material and its printing characteristics.
- Drying
    - Allow prints to level for 10 -15 minutes at room temperature, 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 minute cycle in an air atmosphere.
    - Fire in a 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.
- Retest
    - 6 months

Properties

- Based on Laboratory data using recommended processing procedures Top and bottom conductor : AgPd Micromax™ 7484
- All values reported here are results of experiments in our laboratories intended to illustrate product performance potential with a given experimental design. They are not intended to represent the product's specifications, details of which are available upon demand.

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.

Storage and shelf life

Storage : Containers 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.
Shelf life : This composition’s shelf life is from date of shipment for factory-sealed

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(unopened) containers, stored under room temperature conditions.

Safety and handling

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