Micromax™ LL503

Electronic Inks and Pastes

Co-Fired Gold Via Fill

Micromax™ LL503 is a gold via fill compatible with the Micromax™ GreenTape™ 9K7 low temperature co-fired ceramic (LTCC) tape material and the gold system's companion co-fired conductor members: Micromax™ LL505 (internal signal lines), Micromax™ LL507 (external signal lines) and Micromax™ LL509 (cofirable external solderable).

Product benefits

When used as the via-fill in the Micromax™ GreenTape™ 9K7 LTCC system, Micromax™ LL503 offers the following benefits:

- High reliability, high conductivity metallization
- Co-fire processing
- High circuit density
- Lead, Cadmium, Nickel and Phthalate free*

*Lead, Cadmium, Nickel and Phthalate 'free' as used herein means that lead, cadmium, nickel and phthalate 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™ 9450	
Solid content	90.5 - 92.5[1]	%
Fineness Of Grind, 4th scratch	≤28	µm
Fineness Of Grind, 50% point	≤10	µm

[1]: 750 °C

Rheological properties

Viscosity	3500 - 4500[2]	Pa.s

[2]: Brookfield HBT, UC&S, 1 rpm

Application technique

Drying time	5	min
Drying temperature	100	°C

Storage and stability

Shelf life	4[3]	months

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

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Additional information

How to use

Processing features

- For detailed recommendations on the use of the Micromax™ LL503 via fill with the Micromax™ GreenTape™ 9K7 system, consultant this data sheet and the Micromax™ GreenTape™ LTCC Design Guide. For compatible co-fired and post fired conductor compositions, consult the Micromax™ GreenTape™ 9K7 Product Selector Guide.

Processing

- Printing
  - The composition should be thoroughly stirred prior to use. This is best achieved by a slow, gentle mixing by hand for 1 to 2 minutes using a clean, burr-free spatula (flexible plastic or stainless steel). Care must be taken to avoid air entrapment.
  - Prior to the via fill step, via openings are formed/ punched in the preconditioned Micromax™ GreenTape™ 9K7 green sheets per the applicable circuit design for the respective layers of the build.
  - Print Micromax™ LL503 directly into the open vias using typical through-hole screen printing methods and a stencil mask. The use of a vacuum stone or other support structure which uniformly distributes a vacuum across the green sheet is recommended to assist with the uniform and complete filling of the via array patterns, as well as secure the green sheet to the printer's stage plate during the printing process.
  - Printing should be performed in a clean, well-ventilated area. Optimum printing characteristics are generally achieved when the room and paste container temperatures are in the 20 to 23 °C range.
- Clean-up solvent
  - 1-Propoxy-2-Propanol
- Drying
  - Dry via prints in a well-ventilated oven or conveyor dryer for 5 minutes at 100 °C. Do not over-dry. An alternative drying method is to allow the Micromax™ LL503 fills to dry 6 to 8 hours at ambient room temperature.
- Lamination
  - Collate, stack and laminate multiple sheets of the printed circuit patterns according to the recommended processing parameters detailed in the Micromax™ GreenTape™ LTCC Design Guide.
  - Typical lamination parameters are 3000 psi at 70 °C for 10

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minutes. Lamination pressures may vary slightly based upon part design and the individual tape lot shrinkage factors.

- Firing
  - Fire in a well-ventilated conveyor 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.
  - Micromax™ GreenTape™ 9K7 requires the use of dedicated, specially coated setters in order to prevent parts from sticking during firing.
  - Consult the Micromax™ GreenTape™ 9K7 low temperature co-fired ceramic (LTCC) system data sheets and Micromax™ GreenTape™ LTCC Design Guide for additional details.
  - For further information regarding firing profiles, furnace recommendations and setter tile choices, please contact your local Micromax™ Technical Service Representative.

Properties

- Information in this datasheet shows anticipated typical physical properties for Micromax™ LL503 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 four 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).

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Revised: 2023-06-21 Source: Celanese Materials Database