

# Micromax™ LF162

## Microcircuit and Component Materials

### Encapsulant Composition

Micromax™ LF162 is a lead free encapsulant composition intended to form an insulating and protective layer over thick film circuits. It is an integral element of System LF. It is applied to ceramic substrates by screen printing and fired in an air (oxidising) atmosphere.

### Product characteristics

- Lead, Cadmium, Chromium and Nickel Free\*
- Protection against reactive chemicals
- Fireable on a standard 850 °C profile

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

### Product information

Solvent or thinner

Micromax™ 9179

### Rheological properties

Viscosity

200 - 270<sup>[1]</sup> Pa.s

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

### Application technique

Mask mesh

200 - 325

Drying time

10 - 15 min

Drying temperature

150 °C

Theoretical coverage

110 - 130<sup>[2]</sup> cm<sup>2</sup>/g

Shrinkage, dried

10 - 20 %

Shrinkage, fired

35 - 40 %

Leveling time

5 - 10 min

[2]: based on fired thickness of 17.5 μm

### Storage and stability

Shelf life

6<sup>[3]</sup> months

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

### Additional information

How to use

### Design & compatibility

#### • Compatibility

- Whilst Micromax™ has tested this composition with the

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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

- Use 200-325 mesh stainless steel.
- 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 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 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

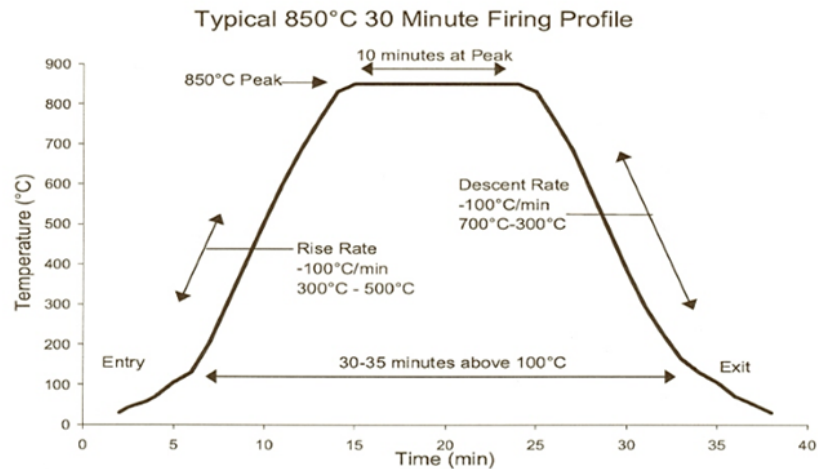
- Allow prints to level for 5-10 minutes at room temperature, then dry for 10-15 minutes at 150°C.
- Dry in a well ventilated oven or conveyor dryer.

#### • 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.

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### Properties

- 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 of Micromax™ LF162 encapsulant composition may be stored in a clean, stable environment at temperature of between 5 °C - 30 °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 has a shelf life of 6 months from date of shipment for factory-sealed (unopened) containers, stored under room temperature conditions.

### Safety and handling

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

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Revised: 2023-03-13 Source: Celanese Materials Database

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