

Micromax™ LF162

Electronic Inks and Pastes

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^[1] 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 ^[2] cm ² /g
Shrinkage, dried	10 - 20 %
Shrinkage, fired	35 - 40 %
Leveling time	5 - 10 min

[2]: based on fired thickness of 17.5µm

Storage and stability

Shelf life 6^[3] months

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

Additional information

How to use

Design & compatibility

• Compatibility

- Whilst Micromax™ has tested this composition with the

Micromax™ LF162

Electronic Inks and Pastes

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**

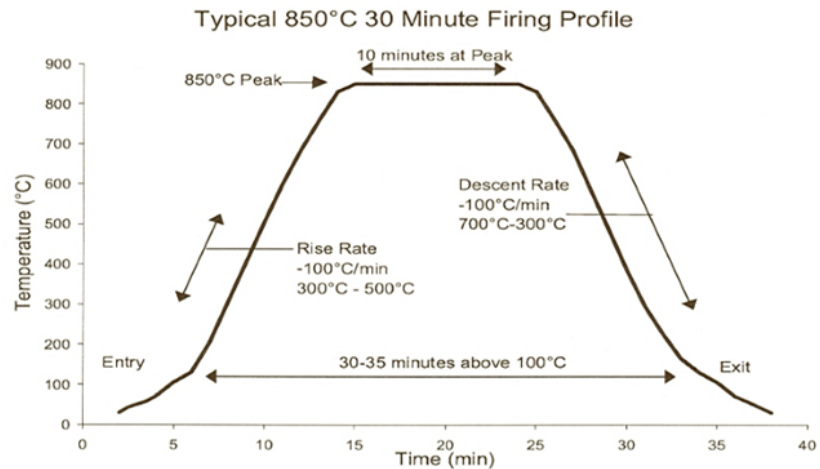
- Allow prints to level for 5-10 minutes at room temperature, then dry for 10-15 minutes at 150°C.
- Dry in a well ventilated oven or conveyor dryer.

- **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.

Micromax™ LF162

Electronic Inks and Pastes



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).

Micromax™ LF162

Electronic Inks and Pastes

Printed: 2023-09-21

Page: 4 of 4

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

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.

© 2023 Celanese or its affiliates. All rights reserved. Celanese®, registered C-ball design and all other trademarks identified herein with ®, TM, SM, unless otherwise noted, are trademarks of Celanese or its affiliates. Fortron is a registered trademark of Fortron Industries LLC. KEPITAL is a registered trademark of Korea Engineering Plastics Company, Ltd.