

Micromax™ 7740

Electronic Inks and Pastes

Silver Conductor

Micromax™ 7740 is designed for applying thick layers of silver onto ceramic substrates. It is intended for use in circuits carrying high current, where both thermal and electrical conductivity are key design features. The paste is applied by screen printing and then fired in a furnace at 850 °C, to form power device mounting sites, pads for components and lead attachment, and interconnection tracks.

Product benefits

- Excellent Thermal and Electrical conductivity
- Optimized for printing thick tracks and large areas
- Ability to produce substrates with varying thickness of silver
- Compatible with Thick Film Resistor

Product information

Solvent or thinner Micromax™ 4553

Rheological properties

Viscosity 110 - 180^[1] Pa.s

[1]: Brookfield HBT, SC4-14/6R, 10 rpm, 25 °C

Application technique

Mask mesh	80 - 200
Drying time	15 min
Drying temperature	150 °C
Theoretical coverage	15 ^[2] cm ² /g
Recommended film thickness, fired	30 - 55 ^[3] μm
Leveling time	2 - 5 min

[2]: at 55 μm fired thickness, printed with 80 mesh stainless steel screens

[3]: min→165-200 mesh, max→80 mesh

Thermal properties

Thermal conductivity 200 W/(m K)

Electrical properties

Surface resistivity 0.38^[2] mOhm per square

[2]: at 55 μm fired thickness, printed with 80 mesh stainless steel screens

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Storage and stability

Shelf life

6^[4] months

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

Additional information

How to use

Processing

- **Substrates**

- Properties are based on tests carried out using 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance.

- **Printing**

- Micromax™ 7740 conductor 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 minute. Printing should be carried out in a clean, well ventilated area. Optimum printing characteristics of Micromax™ 7740 are generally achieved in the room temperature range of 20 °C - 23 °C. Its is therefore, important that the material, in its container, is at this temperature prior to commencement of printing.
- Screen mesh selection depends on the film thickness required. A 165-200 mesh screen can be used to maximize the print thickness for the first layer of Micromax™ 7740 (30-40µm). Areas where increased thickness is needed should be overprinted with a subsequent layer or layers to build up the thickness. A coarser mesh screen can be used to process the subsequent layers. When selecting the screen mesh, resolution and/or surface roughness requirements for the application should be to considered. A 105 mesh screen can be used to achieve the maximum recommended print thickness of the subsequent layers (approx. 60µm fired per layer). It is also advisable to "step in" the dimension of overprinted layers from the edge of the underlying layer to maximize the surface planarity.
- The Micromax™ 7740 thickness should be build up using sequential print/dry/fire processing, since co-firing of layers may be detrimental to density and adhesion of the fired film. A build sequence which incorporates three layers of Micromax™ 7740 (165 mesh P/D/F, 105 mesh P/D/F, 105 mesh P/D/F) will provide the recommended maximum total thickness of 170µm.
- The TCE difference between a thick metal layer and alumina may lead to some bowing when large area substrates are printed on one side only. The degree of bowing is greater with thinner substrates, thicker metallization or larger print area.

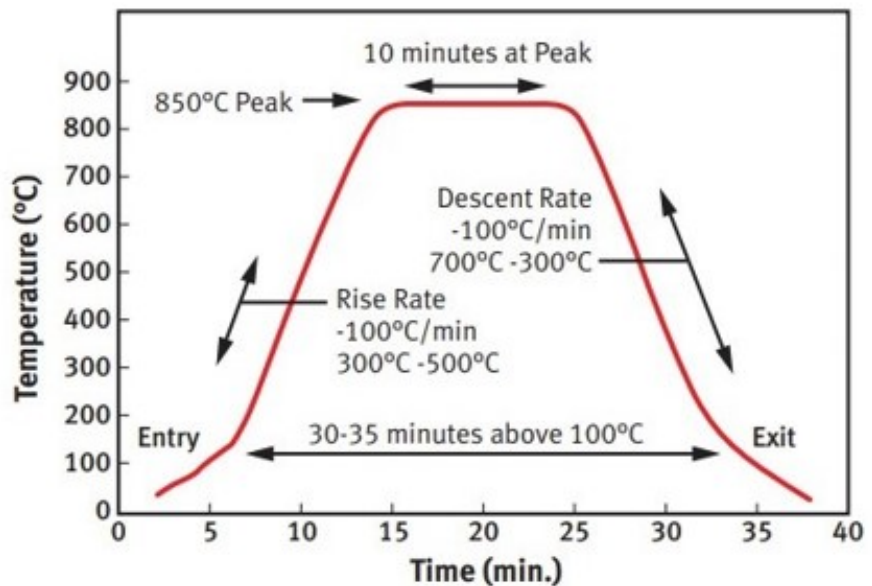
- **Thinning**

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- Micromax™ 7740 conductor is optimized for screen printing and thinning is not normally required. Micromax™ 4553 may be used sparingly for slight adjustments to viscosity or to replace evaporation losses.
- **Drying**
 - Allow prints to level at room temperature for 2-5 minutes. Dry for 15 minutes at 150°C in a well ventilated oven, or using a belt dryer.
- **Firing**
 - Fire in a well ventilated belt or conveyor furnace, in air with a 30 minute cycle to a peak temperature of 850°C for 10 minutes.

Typical 850°C 30 Minute Firing Profile



Properties

- Information in this datasheet shows anticipated typical physical properties for Micromax™ 7740 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

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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).

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.

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