Micromax™ 7740

Microcircuit and Component Materials

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 55µm 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 - 38[2]	mOhm per square

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

Micromax™ 7740

Microcircuit and Component Materials

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

Micromax™ 7740

Microcircuit and Component Materials

- Micromax™ 7740 conductor is optimized for screen printing and thinning in 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 at150 °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.

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 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).

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