

Micromax™ 5480

Electronic Inks and Pastes

Polymer Series Composition

Micromax™ 548X polymer compositions are intended for encapsulation on hybrid circuits, resistor networks and chip components. The polymers are intended to be applied to ceramic substrates by screen printing, then cured at 180-200 °C.

Product benefits

- Smooth surface with excellent hardness
- Non-flammable single component epoxy type
- Thermoset process (180-200 °C, 20-30 min)
- High adhesion
- Good Printability
- Good solvent and environmental resistance

Product information

Colour	White
Solvent or thinner	Micromax™ 5490
Blend member or series	548Xsrs

Rheological properties

Viscosity	40 - 70 ^[1] Pa.s
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[1]: Brookfield HAT, UC&SP, SC4-14/6R, 10 rpm, 25 °C ± 0.5 °C

Application technique

Mask mesh	200
Mask emulsion	20 μm
Drying time	10 min
Drying temperature	150 °C
Theoretical coverage	240 ^[2] cm ² /g
Recommended film thickness	12 - 14 ^[3] μm
Leveling time	5 - 10 min

[2]: ~240, based on a cured film thickness of 13 μm

[3]: cured thickness

Electrical properties

Insulation Resistance, DC	≥1E15 Ohm
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[4]: Ω•cm, Encapsulant 5480, initial

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Storage and stability

Shelf life

3^[5] months

[5]: in unopened containers, from date of shipment, at temperature between 0-5 °C

Additional information

How to use

Design & compatibility

- **Design**

- For optimum smoothness, printing with a double pass squeegee is recommended.

Processing

- **Substrates**

- Substrates of different compositions and from various manufacturers may result in variations in performance properties.

- **Printing**

- 12-14µm cured thickness, this is best achieved using a 200 mesh stainless steel screen with a 20µm emulsion thickness and squeegee of 70 durometer.
- 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) 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.

- **Thinning**

- The compositions are optimized for screen printing, thinning is not normally required. When necessary, 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 behavior of the material and its printing characteristics.

- **Clean-up solvent**

- Micromax™ 5490

- **Drying**

- Allow prints to level for 5-10 minutes at room temperature, then dry for 10 minutes at 150 °C.

- **Curing**

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- 180-200 °C for 20-30 minutes. A darkening of the polymer film will occur with higher curing temperatures. Fast curing can be achieved with an infrared dryer. Conditions need to be optimized for type of dryer and color of paste.

Properties

Typical Cured Properties*¹, Encapsulant Micromax™ 5480 (White)

Test	Properties
Bulk Resistivity (Ω.cm) After PCT* ²	> 1x10 ¹²
Insulation resistivity (Ω.cm) After PCT* ²	> 3x10 ¹²
Solvent resistance* ³ Acetone	No appearance change
Solvent resistance* ³ MEK	No appearance change
Alkali resistance* ³ (10 wt%/NaOH)	No appearance change
Acid resistance* ³ (10 vol %/HCl)	No appearance change
Adhesion* ⁴ On glass substrate Initial	OK
Adhesion* ⁴ On glass substrate After PCT* ²	OK
Adhesion* ⁴ On alumina substrate Initial	OK
Adhesion* ⁴ On alumina substrate After PCT* ²	OK

*¹ Curing conditions are 180 °C, 30 minutes profile single curing cycle

*² PCT : Pressure cooker test at 125 °C, 2 atmospheres, for 3 hours

*³ 5 hours Immersion at 25 °C

*⁴ Crosscut Scotch tape peel test (100 pads)

Information in this datasheet shows anticipated typical physical properties for Micromax™ 548X series 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 0 °C - 5 °C. Shelf life of material in unopened containers is three months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

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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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