

Micromax™ 4195

Electronic Inks & Pastes

PRODUCT DESCRIPTION

High Temperature Glass Encapsulant

High temperature glass encapsulant composition Micromax™ 4195 is intended to form an insulating and protective layer over thick film circuits and especially over thick film silver bearing conductors. It is applied to ceramic substrates by screen printing and fired in a conveyor furnace in an air (oxidizing) atmosphere.

Product benefits

- Protection against silver migration of adjacent silver bearing conductor lines and solder barrier
- Protection against environmental conditions, and mechanical abrasion
- Protection against reactive chemicals and potting compounds
- Blue fired film
- Fired at a peak temperature of 850°C

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

PRODUCT INFORMATION

General Properties

Value Unit

Application Hybrid encapsulant

TECHNICAL DATA

Rheological Properties

Value Unit

Viscosity¹ 170 to 230 Pa.s

Application Technique

Value Unit

Mask mesh 200 to 250

Mask emulsion 10 to 12 µm

Drying time 10 to 15 min

Drying temperature 150 °C

Application Technique	Value	Unit
Theoretical coverage ²	80 to 90	cm ² /g
Recommended film thickness	18 to 20	µm
Leveling time	5 to 10	min

Storage and Stability	Value	Unit
Shelf life ³	6	months

¹Brookfield HBF, #5, 10 rpm, 25°C ± 0.1°C

²based on wet film thickness of 50 µm

³in unopened containers, from date of shipment, stable environment at room temperature between 5°C - 30°C

PROCESSING GUIDELINES

Design & compatibility

Design

Properties are based on tests on 96% alumina substrates. Micromax™ 4195 encapsulant composition can be used with Micromax™ silver bearing conductors such as Micromax™ 7484R, and 6160. Glass encapsulant Micromax™ 4195 is not usually suggested as a resistor encapsulant. This encapsulant is not suitable for laser trimming. It should also be noted that refiring of thick film resistors at high temperature will change the resistance values, so allowances should be made for this in the processing and design of a circuit.

Compatibility

While Micromax™ has tested this composition with the materials specified above and the 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 materials in their specific situations in order to completely satisfy themselves with the overall quality and suitability of the compositions for their intended application(s).

Substrates

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

Printing

The use of a double wet pass print mode should help to minimize pinholes in the film, 200 or 250 mesh stainless steel screen with 45° bias and 10-12µm emulsion thickness. Print speed of 2.5-10 cm/sec.

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 behavior of the material and its printing characteristics.

Drying

10-15 minutes at 150°C.

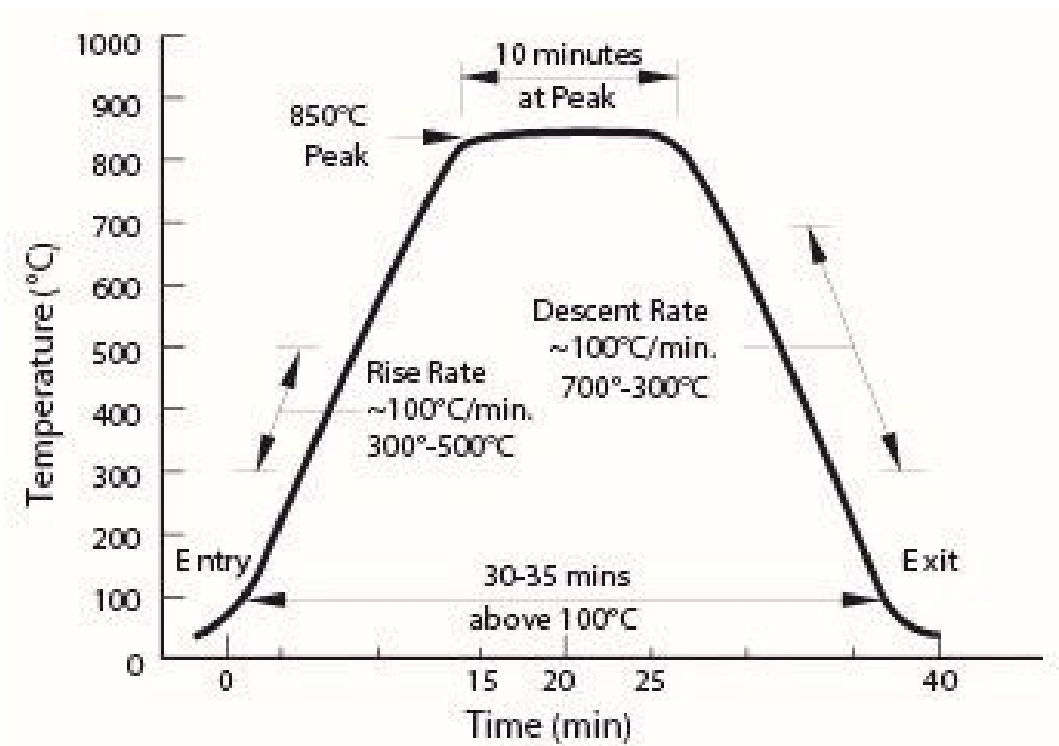
Allow prints to level for 5-10 minutes at room temperature, then dry in a well-ventilated oven or conveyor dryer.

Firing

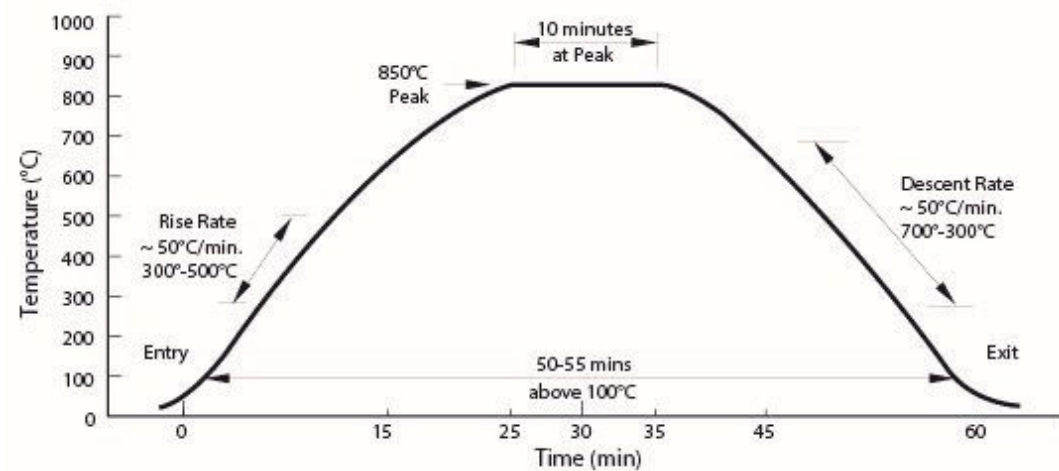
850°C peak held for 10 minutes on 30/60 minute cycle in an air atmosphere.

Fire in a well-ventilated belt or conveyor 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.

Typical 30 Minute Profile



Typical 60 Minute Profile



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

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature between 5°C - 30°C. Shelf life of material in unopened containers is 6 months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Storage conditions on the product data sheets are intended to represent long-term material storage recommendations and not a shipping or temperature-at-receipt requirement.

Transportation: Under normal shipping conditions, without temperature control, Micromax™ products are not expected to exhibit a change in quality or fitness for use. Should extraordinary events result in extended transportation periods, Micromax™ recommends customers confirm products remain suitable for the intended application.

Safety and handling

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

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use.

Safety Data Sheets are available.

WASTE TREATMENT

Prior to using any recommendations or suggestions for waste treatment, the user is required to know the appropriate local/state/federal regulations for on-site or off-site treatment which may require permits. If there is any conflict regarding our recommendations, local/state/federal regulations take precedence.

CONTACT INFORMATION

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE. Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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