

Micromax™ 5082R

Electronic Inks & Pastes

PRODUCT DESCRIPTION

Silver Brazing Low Temperature Braze System

Micromax™ 5081R and 5082R constitute a two component, all thick films paste system designed to facilitate the use of high temperature solders and low temperature alloys on :

- 96% alumina and Low temperature cofire ceramic (Micromax™ GreenTape™ 951 low temperature co-fired ceramic system).
- Alumina
- Multilayer hybrid circuits

Product benefits

- High strength, high reliability attachment mechanism
- Hermetic packaging
- Compatibility with thick film resistors, as well as all conventional IC and lid attach processes
- Phthalate and Cadmium free*

* Phthalate and Cadmium oxide 'free' as used herein means that cadmium and phthalate are not intentional ingredients in and are not intentionally added to the referenced product. Trace amounts however may be present.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

PRODUCT INFORMATION

General Properties	Value Unit
Application	LTCC Ag/Pt conductor
Solvent or thinner	Micromax™ 9180R
Blend member or series	5081R and 5082R

TECHNICAL DATA

Rheological Properties	Value Unit
Viscosity ¹	225 to 325 Pa.s

Application Technique	Value	Unit
Mask mesh	325	
Mask emulsion	13	µm
Drying time	10 to 15	min
Drying temperature	150	°C
Recommended film thickness	≥20	µm
Leveling time	≥10	min

Electrical Properties	Value	Unit
Resistivity ²	≤5	mOhm per square

Storage and Stability	Value	Unit
Shelf life ³	6	months

¹Brookfield 2xHA, UC&SP;, SC4-14/6R, 10 rpm, 25°C ± 0.2°C

²at 10µm fired thickness

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

PROCESSING GUIDELINES

Design & compatibility

Compatibility

Whilst 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 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).

Substrates

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

Screen types

Print onto fired Micromax™ 5081R using a 325-mesh stainless steel screen with 13µm emulsion build up. Ensure that Micromax™ 5082R completely covers the Micromax™ 5081R print.

Printing

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 about 1-2 minutes. Care must be taken to avoid air entrapment. Printing should be performed in a 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 the 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

Micromax™ 5081R and 5082R compositions are optimized for screen printing and 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 materials and their printing characteristics.

Drying

Allow prints to level for over 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 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.

Repeat previous printing, drying and firing steps

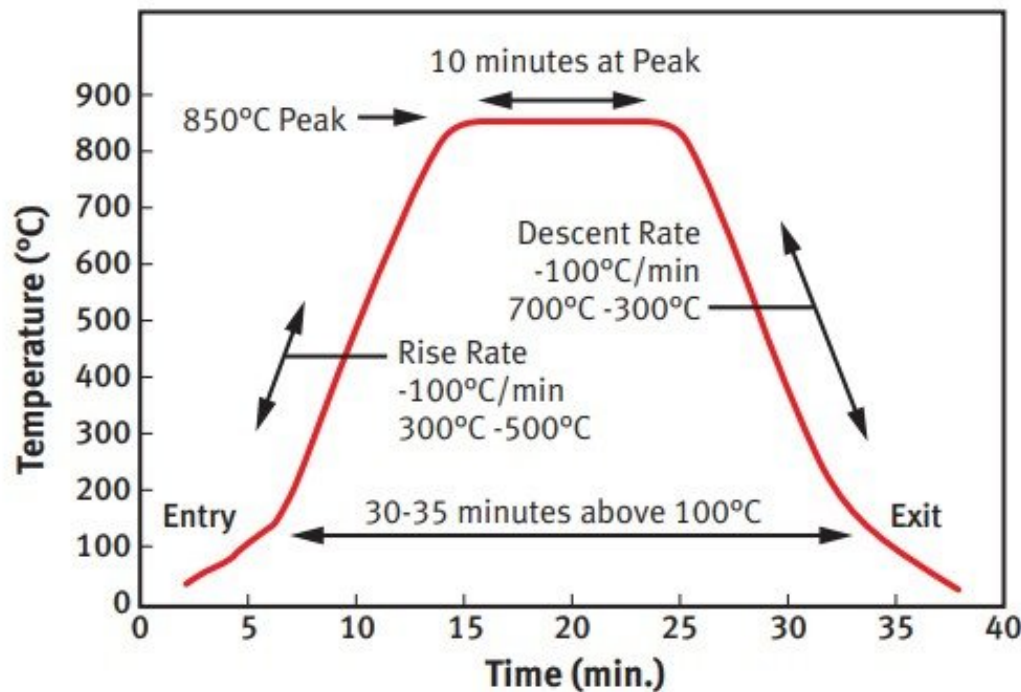
Ensure that Micromax™ 5082R completely covers the Micromax™ 5081R print.

Total Micromax™ 5082R fired thickness should be $> 20\mu\text{m}$. The thickness of the Micromax™ 5082R depends on the type of alloy and brazing temperature used.

Attachment

Once the substrate has been prepared with Micromax™ 5081R and 5082R, pins, window frames or heat sinks may be attached with braze alloys (Au/Sn), preforms or pastes. Brazing is performed in nitrogen atmosphere using fixed fixtures which position the attachment and braze alloy directly on top of the Micromax™ 5081R/5082R metallization.

FIGURE 1. 30 MINUTES PROFILE



Typical Fired Properties*¹

Test	Properties
PGA Reliability Thermal Cycle* ² (lbs)	≥ 15
PGA Reliability Thermal Aging* ³ (lbs)	≥ 15
Seal Ring Reliability* ⁴ (Atm cm ³ /s)	< 10 ⁻⁸

*¹ Average tensile pull strength of a pin in a standard grind array (PGA) brazed on 96% alumina or Micromax™ 951 GreenTape™. PGA consist of 1.8mm diameter pad of Micromax™ 5081R/5082R, and a 400µm diameter Kovar pin with a 800µm diameter nail head. 80Au/20Sn braze preform.

Firing : 30 minute cycles to a peak temperature of 850°C for 10 minutes.

*² 200 cycles, -40°C to 125°C, Rapid transfer

*³ 200 hrs in air at 150°C

*⁴ Helium leak test to Kovar seal ring on Micromax™ 951 GreenTape™, 100 thermal cycles, -25°C to +85°C

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

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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