

Micromax™ 9475R

Microcircuit and Component Materials

AgPd Pt Conductor Composition

Micromax™ 9475R Ag/Pd/Pt conductor is designed to be used for large aluminium wire bonding. It is intended to be applied to ceramic substrates by screen printing and fired in a conveyor furnace in an air (oxidising) atmosphere. It has been developed to offer excellent performance on alumina for component attachment, resistor termination and large aluminium wire bonding.

Product benefits

- Bondable with thick 250 aluminium wire
- Optimised for 30 minute 850 °C firing profile
- Cadmium, Nickel and Phthalate free*

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

Product information

Solvent or thinner

Micromax™ 9180R

Rheological properties

Viscosity

83 - 113^[1] Pa.s

[1]: Haake cone and plate rheometer, 30 seconds shear at 33s-1, temperature 23+/-0.5 °C

Application technique

Mask mesh

200 - 250^[2]

Mask emulsion

12 - 14 µm

Drying time

10 - 15 min

Drying temperature

150 °C

Theoretical coverage

72 - 77^[3] cm²/g

Recommended film thickness, fired

10 - 14 µm

Shrinkage, fired

40 - 45 %

Leveling time

10 min

[2]: Screen Types: Stainless steel

[3]: Based on fired thickness of 14µm

Electrical properties

Surface resistivity

≤40^[4] mOhm per square

Hot Temperature Coefficient Resistance

350 - 450 ppm/K

[4]: on alumina, @12µm fired thickness

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Storage and stability

Shelf life

6^[5] months

[5]: in unopened containers, from date of shipment, at room temperature (between 5 °C – 30 °C)

Additional information

How to use

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).

Processing

- **Substrates**

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

- **Screen type**

- 200-250 mesh stainless steel screen with a 12-14µm emulsion build up.

- **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™ 9475R composition is 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

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behaviour of the material and its printing characteristics.

- **Drying**
 - Allow prints to level at room temperature, then 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.

Properties

Typical fired properties*¹

Test	Properties
Solder Acceptance* ² (%) 62Sn/36Pb/2Ag @220 °C	≥90 coverage
Solder Leach Resistance 62Sn/36Pb/2Ag @230 °C	6 cycles
Adhesion* ³ (N) Initial (1xfiring)	≥20
Adhesion* ³ (N) Aged 48hrs @150 °C	≥18
250µm Al Wire Bonding on alumina* ⁴ Initial (g)	≥350
250µm Al Wire Bonding on alumina* ⁴ 1000 hrs @10 °C (g)	≥250

Test Procedure

*¹ Typical properties are based on laboratory data using recommended processing procedures. Unless expressly noted elsewhere the following processing conditions have been used:

Printing: 200 mesh stainless steel screen, 12-14µm emulsion thickness

Firing: 3x 30 minute cycles to a peak temperature of 850 °C for 10 minutes Tested on 96% alumina substrates

*² Using Alpha 611 flux. Solder coverage measured after a 5s dip in solder. A leaching cycle is represented by a 10s dip in solder and tested on 500µm lines.

*³ 90° wire peel test on 2mmx 2mm pads soldered with 62Sn/36Pb/2Ag solder at 220 °C and using a mildly activated Alpha 611.

*⁴ Orthodyne Model 20, double V groove, tool force 350g, 250µm Al wire

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(99.99%), elongation 10-15%, tensile strength 370-450g.

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 may be stored in a clean, stable environment at room temperature (between 5 °C – 30 °C) with their lids tightly sealed. Storage in high temperature (<30 °C) or in freezers (temperature <0 °C) is NOT recommended as this could cause irreversible changes in the material. The shelf life of compositions in factory-sealed (unopened) containers between (5 °C – 30 °C) is 6 months from date of shipment.

Safety and handling

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