Micromax™ 5029

Electronic Inks and Pastes

Polymer Silver For Smartcard Application

Micromax™ 5029 is a silver composition designed for the printing of coils or antenna in smartcard and RFID tags.

Product benefits

- High conductivity
- High print thickness in a single print
- Higher solids, lowest resistivity after lamination

Product information

Solvent or thinner	Micromax™ 3610	
Solid content	79.5 - 81.5[1]	%

[1]: 750 °C

Rheological properties

Viscosity	35 - 50[2]	Pa.s

[2]: Brookfield 1/2RVT, UC&S(SC4-14/6R), 10 rpm, 25 °C ± 0.2 °C

Application technique

Mask mesh	200[3]	
Mask emulsion	15[3]	µm
Theoretical coverage	60 - 80[4]	cm^2/g
Recommended film thickness, dried	20 - 30	µm

[3]: Screen Types: Stainless steel

[4]: 200 mesh stainless steel / 15 µm emulsion

Electrical properties

Surface resistivity	≤15[5]	mOhm per square

[5]: After Drying. Sheet Resistivity : line thickness 25µm, substrate 160µm PVC. After Lamination 4 - 8 (mΩ/sq).

Storage and stability

Shelf life	6[6]	months

[6]: in unopened containers, from date of shipment, at temperature <25 °C

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Additional information

How to use

Processing

- Substrates
  - Polyester, PVC, Polycarbonate, ABS, Polymide
- Screen types
  - 200 mesh stainless steel or 62T polyester screen
- Printing
  - Reel to reel, semi-automatic or manual
  - The composition should be thoroughly mixed before use. This is best achieved by slow, gently, 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.
  - The screen and emulsion thickness will strongly influence the thickness and definition of the printed circuit. Typically, polyester screens (62T-77T) with 20-25µm for Micromax™ 5029. Stainless steel screens may also be employed and will result in higher definition and thicker prints at a given mesh count. This will affect the achieved resistance. Normally only one print is needed to achieve the thickness. For very thick tracks, multiple prints may be utilized. In this case should be an intermediate drying stage.
  - For design with very fine lines at 150µm or less than the screen should be selected to give a thinner print as such line cannot be resolved consistently with thick prints.
  - The printer conditions should be set to maximize the print thickness. This means using a high print speed and setting a low squeegee pressure. Typically this paste can be printed at speeds from 30-60 cm/s. 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.
- Typical circuit line thickness
  - 200 mesh stainless steel / 15µm emulsion build up to achieve line thickness of 20-30µm
  - 62T polyester screen / 20µm emulsion build up to achieve line thickness of 18-22µm
- 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

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printing characteristics.

- Clean-up solvent
  - Ethylene glycol diacetate
- Drying (conveyor oven)
  - PVC substrates 15-30 minutes, at a peak temperature 50-60°C
  - Polyester substrates 2-5 minutes, at a peak temperature 120-130°C
  - Dry and cure in a well ventilated oven or conveyor dryer where the exhaust meets environmental regulations.
- Lamination
  - This composition can be processed through standard card lamination processor. These processes significantly reduce the achieved resistance.

Properties

- Information in this datasheet shows anticipated typical physical properties for Micromax™ 5029 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

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 (<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).

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