

Electronic Inks and Pastes

99XXB Lead-Free Series-Heated Glass Compositions

Micromax[™] 99XXB Series is provided for use in production of electrically heated backlinghts by the "direct" (unplated) method. The pastes can be blended with each other to obtain a wide range of eledtrical resistance.

Product benefits

- · Dark fired color
- High green strength
- · Lead, Cadmium, Nickel and Phthalate free*
- · Low sensitivity to firing temoerature
- Supplied ready to print

Product information

| Solvent or thinner | Micromax™ 9450 |
|------------------------|---------------------|
| Density | 3 g/cm ³ |
| Solid content | 74.4 - 76.4 % |
| Silver content | 68.4 - 70.3 % |
| Blend member or series | 99XXBsrs |

Rheological properties

| Viscosity | 25 - 35 ^[1] Pa.s |
|-----------|-----------------------------|
| | |

[1]: Brookfield 0.5 x RVT #7 @20rpm

Application technique

| Mask mesh | 150 - 250 |
|-----------------------------------|------------|
| Mask emulsion | 15 - 25 μm |
| Drying temperature | 125 °C |
| Recommended film thickness, fired | 8 - 12 um |

Electrical properties

| Surface resistivity | 6.3 - 11.3 ^[2] mOhm per |
|---------------------|------------------------------------|
| | square |

[2]: Rel. Range (±%) 29

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



Flectronic Inks and Pastes

Storage and stability

Shelf life 6^[3] months

[3]: in unopened containers, from date of shipment, at room temperature (<25°C)

Additional information

How to use Processing

Blendability

 In order to obtain a specific resistance value, the pastes can be blended with each other. The MicromaxTM 99XXB Series data can be used to determine blend recipes for specific heated window designs.

Substrates

• 2"x4" soda lime silicate glass, 4 mm thick.

Printing

- o 156 mesh polyester screen, 20µm emulsion
- Screen mesh size: 150-250 per inch
- Emulsion thickness: 15-25 μm
- · Emulsion type: terpene resistant
- Enamel compatibility: Air Dried and some UV

Drying

Allow printed paste to dry to desired green strength at 125°C.

Firing

- 12 minute cycle, 5 zone belt furnace, peak temp of 640 °C.
- Average glass surface temp: 600-670°C over enamel
- Average glass surface temp: 600-700°C over glass
- Furnace atmosphere : Solvent and sulphite free

Soldering

- · Burnish: Steel Wool or Fiberglass
- Flux: Type R rosin
- o Connector: Cu Clip or Braid pref. pretinned

Adhesion test

• Soldered copper clip, 70Pb/27Sn/3Ag, reflow with flame.

Properties

Composition and Typical Fired Properties

| • | |
|---|-------------|
| Test | Properties |
| Line Width (μm) | 350 - 800 |
| Air side Color | Light-brown |
| Tin side Color | Dark-brown |

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| Solder metallurgy 320-350°C/5 sec | 60Pb/27Sn/3Ag/10Bi |
|-----------------------------------|--------------------|
| Solder metallurgy 320-400°C/5 sec | 70Pb/27Sn/3Ag |

Information in this datasheet shows anticipated typical physical properties for MicromaxTM 99XXB 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 shlef 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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Adhesion solder after heat ageing



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